BEFORE THE PUBLIC SERVICE COMMISSION

OF SOUTH CAROLINA

REBUTTAL TESTIMONY OF

JAMES H. VANDER WEIDE, PH.D.

ON BEHALF OF

DOMINION ENERGY SOUTH CAROLINA, INC.

DOCKET NO. 2020-125-E

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I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME, TITLE, AND BUSINESS ADDRESS.

A. My name is James H. Vander Weide. I am President of Financial Strategy Associates, a firm that provides strategic and financial consulting services to business clients. My business address is 3606 Stoneybrook Drive, Durham, North Carolina 27705.

Q. ARE YOU THE SAME JAMES H. VANDER WEIDE WHO PROVIDED DIRECT TESTIMONY IN THIS PROCEEDING?

A. Yes, I am.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. I have been asked by Dominion Energy South Carolina, Inc. ("DESC" or the "Company") to review the direct testimonies and cost of capital recommendations of Dr. J. Randall Woolridge, Mr. Aaron R. Rothschild, and Dr. Zhen Zhu, and to respond to their cost of capital and allowed rate of return recommendations in this proceeding. Dr. Woolridge's testimony is presented on behalf of the South Carolina Office of Regulatory Staff ("ORS"), Mr. Rothschild is appearing on behalf of the South Carolina Department of Consumer Affairs ("DCA"), and Dr. Zhu is appearing on behalf of the United States Department of Defense and all other Federal Executive Agencies ("DoD/FEA"). In addition, I have been asked to review the testimonies and recommendations of Mr. Lane Kollen with regard to the cost of debt and capital structure, Mr. Kevin W. O'Donnell with regard to the cost of debt, and Ms. Lisa V. Perry with regard to allowed rates of return on equity that have been found in other electric utility rate proceedings. Mr. Kollen testifies on behalf of the ORS, Mr. O'Donnell testifies on behalf of the South Carolina Energy Users Committee ("SCEUC"), and Ms. Perry testifies on behalf of Walmart Inc.

Q. IS THERE ANYTHING IN THE TESTIMONIES OF DR. WOOLRIDGE, MR. ROTHSCHILD, OR DR. ZHU THAT CAUSES YOU TO CHANGE YOUR CONCLUSION THAT DESC'S REQUESTED 10.25 PERCENT ALLOWED RETURN ON EQUITY IS FAIR AND REASONABLE?

A. No, there is not. My analyses continue to support DESC's 10.25 percent requested allowed rate of return on equity.

Q. THE STUDIES IN YOUR DIRECT TESTIMONY INCLUDED MARKET DATA THROUGH MAY 31, 2020. HAVE YOU UPDATED YOUR STUDIES TO INCLUDE CAPITAL MARKET RESULTS THROUGH OCTOBER 31, 2020?

A. Yes. Based on capital market results through October 31, 2020, my studies indicate a base cost of equity equal to 9.7 percent. After adjusting for the higher financial risk of DESC's regulatory book value capital structure, which contains 53.35 percent equity, compared to the lower financial risk of the proxy companies' market value capital structure, which contains approximately 64 percent equity at October 2020, the required return on equity for DESC is 10.3 percent. (See Table 1 below and Exhibit Nos. __ (JVW-1 Rebuttal, JVW-2 Rebuttal, JVW-3 Rebuttal, JVW-4 Rebuttal, JVW-5 Rebuttal, and JVW-6 Rebuttal.) These exhibits were prepared under my direction and control, and the information contained therein is true and correct to the best of my knowledge and belief.

Table 1
Updated Cost of Equity Model Results

COST OF EQUITY MODEL	MODEL RESULT
Discounted Cash Flow	9.0%
Ex Ante Risk Premium	10.0%
Ex Post Risk Premium	8.9%
CAPM – Historical	9.5%
CAPM – Forward looking	10.8%
Comparable Earnings	10.0%
Average	9.7%
Financial Risk Adjustment	.58%
Recommended Allowed Return on Equity	10.3%

II. REBUTTAL OF SOUTH CAROLINA OFFICE OF REGULATORY STAFF WITNESS DR. J. RANDALL WOOLRIDGE

Q. WHAT IS DR. WOOLRIDGE'S RECOMMENDED RATE OF RETURN ON EQUITY FOR DESC?

A. Dr. Woolridge recommends that DESC be allowed an opportunity to earn a rate of return on equity equal to 8.9 percent. (Woolridge at 8)

Q. DO YOU AGREE WITH DR. WOOLRIDGE'S RECOMMENDED 8.9 PERCENT RATE OF RETURN ON EQUITY FOR DESC?

A. No. The cost of equity studies presented in my direct testimony and my updated cost of equity studies in this testimony provide strong evidence that DESC's cost of equity is at least 135 basis points higher than Dr. Woolridge's recommended 8.9 percent allowed rate of return on equity. Based on this evidence, I recommend that Dr. Woolridge's 8.9 percent allowed return on equity be rejected and the Company's recommended 10.25 percent allowed return on equity be accepted.

Q. WHAT CAPITAL STRUCTURE AND DEBT COST RATES DOES DR. WOOLRIDGE RECOMMEND FOR DESC?

A. Dr. Woolridge proposes a capital structure of 50 percent long-term debt and 50 percent common equity. With regard to the cost of debt, Dr. Woolridge does not provide an independent analysis of DESC's cost of debt, but rather accepts a cost of long-term debt equal to 5.56 percent based on the testimony of ORS Witness Kollen (Woolridge at 8).

Q. DO YOU AGREE WITH DR. WOOLRIDGE'S RECOMMENDED CAPITAL STRUCTURE AND COST OF DEBT?

A. No. Dr. Woolridge's proposed capital structure containing 50 percent debt/50 percent equity would not allow DESC an opportunity to earn a reasonable return on the 53.35 percent equity contained in the Company's regulatory capital structure. Dr. Woolridge's proposed debt cost rate equal to 5.56 percent, which is 90 basis points lower than the Company's actual cost of debt, would further harm the Company's ability to earn a fair rate of return on equity.

Q. WHAT AREAS OF DR. WOOLRIDGE'S TESTIMONY WILL YOU ADDRESS IN YOUR REBUTTAL TESTIMONY?

A. I will address Dr. Woolridge's: (1) discounted cash flow ("DCF") analysis; (2) Capital Asset Pricing Model ("CAPM") analysis; (3) comments on the relationship between utilities' rates of return on equity and their market-to-book ratios; and (4) comments on my direct testimony.

A. DCF ANALYSIS

Q. WHAT IS THE DCF MODEL?

A. The DCF model is a model of stock valuation that assumes that a company's stock price is equal to the present discounted value of all expected future dividends investors expect to

receive from owning the stock. Assuming that dividends are paid annually and grow at a constant annual rate, g, the resulting cost of equity equation is $k = D_1/P_s + g$, where k is the cost of equity, D_1 is the expected first period annual dividend, P_s is the current price of the stock, and g is the constant annual growth rate in earnings, dividends, and book value per share. The term D_1/P_s is called the expected dividend yield component of the annual DCF model, and the term g is called the expected growth component of the annual DCF model.

Q. DOES DR. WOOLRIDGE USE THE ANNUAL DCF MODEL TO ESTIMATE DESC'S COST OF EQUITY?

A. Yes, he does.

Q. WHAT COST OF EQUITY RESULT DOES DR. WOOLRIDGE OBTAIN FROM HIS APPLICATION OF THE ANNUAL DCF MODEL?

A. Dr. Woolridge obtains a cost of equity result of 8.9 percent for his Electric Proxy Group and a DCF result of 8.85 percent for the Vander Weide Proxy Group. (Woolridge at 42 and Woolridge Exhibit JRW-7)

Q. WHAT SPECIFIC FORM OF THE ANNUAL DCF MODEL DOES DR. WOOLRIDGE USE TO ESTIMATE DESC'S COST OF EQUITY?

A. Dr. Woolridge uses an annual DCF model of the form, $k = D_0(1+.5g)/P_0 + g$, where k is the cost of equity, D_0 is the current annual dividend, P_0 is the current stock price, and g is the average expected future growth in the company's earnings and dividends per share.

Q. WHAT ARE THE BASIC ASSUMPTIONS OF DR. WOOLRIDGE'S ANNUAL DCF MODEL?

A. Dr. Woolridge's annual DCF model is based on the assumptions that: (1) a company's stock price is equal to the present value of the future dividends investors expect to receive from their investment in the company; (2) dividends are paid annually; (3) dividends, earnings, and book values are expected to grow at the same constant rate forever; and (4) the first dividend is received one year from the date of the analysis.

Q. DO YOU AGREE WITH DR. WOOLRIDGE'S USE OF AN ANNUAL DCF MODEL TO ESTIMATE DESC'S COST OF EQUITY?

A. No. Dr. Woolridge's annual DCF model is based on the assumption that companies pay dividends only at the end of each year. Since Dr. Woolridge's proxy companies all pay dividends quarterly, Dr. Woolridge should have used the quarterly DCF model described in Exhibit No. __ (JVW-3) and Exhibit No. __ (JVW-4) of my direct testimony to estimate DESC's cost of equity.

Q. WHY IS IT UNREASONABLE TO USE AN ANNUAL DCF MODEL TO ESTIMATE THE COST OF EQUITY FOR COMPANIES THAT PAY DIVIDENDS QUARTERLY?

A. It is unreasonable to apply an annual DCF model to companies that pay dividends quarterly because: (1) the DCF model is based on the assumption that a company's stock price is equal to the present value of the expected future dividends associated with investing in the company's stock; and (2) the annual DCF model cannot be derived from this assumption when dividends are paid quarterly.

Q. DOES DR. WOOLRIDGE ACKNOWLEDGE THAT ONE MUST RECOGNIZE THE ASSUMPTIONS OF THE DCF MODEL WHEN ESTIMATING THE MODEL'S INPUTS?

A. Yes. Dr. Woolridge states, "In general, one must recognize the assumptions under which the DCF model was developed in estimating its components (the dividend yield and expected growth rate)." (Woolridge at 33)

Q. RECOGNIZING YOUR DISAGREEMENT WITH DR. WOOLRIDGE'S USE OF AN ANNUAL DCF MODEL, DID DR. WOOLRIDGE APPLY THE ANNUAL DCF MODEL CORRECTLY?

A. No. Dr. Woolridge's annual DCF model is based on the assumption that dividends will grow at the same constant rate forever. Under the assumption that dividends will grow at the same constant rate forever, the cost of equity is given by the equation, $k = D_0 (1 + g) / P_0 + g$, where D_0 is the current annualized dividend, P_0 is the stock price, and g is the expected constant annual growth rate. Thus, the correct first period dividend in the annual DCF model is the current annualized dividend multiplied by the factor, (1 + growth rate). Instead, Dr. Woolridge uses the current annualized dividend multiplied by the factor (1 + 0.5 times growth rate) as the first period dividend in his DCF model. (Woolridge at 35) This incorrect procedure, apart from other errors in his methods, causes him to underestimate DESC's cost of equity.

Q. DOES DR. WOOLRIDGE APPLY HIS ANNUAL DCF MODEL DIRECTLY TO DESC?

A. No. Because DESC's stock is not publicly traded, Dr. Woolridge applies his annual DCF model to two groups of electric utilities, including a group of electric utilities that meet Dr. Woolridge's proxy selection criteria (see Woolridge at 21) and the electric utilities in the comparable group I use to estimate DESC's cost of equity in my direct testimony.

Q. WHAT DATA DOES DR. WOOLRIDGE CONSIDER FOR ESTIMATING THE DIVIDEND YIELD COMPONENT OF HIS ANNUAL DCF MODEL?

A. Dr. Woolridge considers the median dividend yields for his proxy companies calculated by dividing each company's current annual dividend by stock prices over the most recent thirty-day, ninety-day, and 180-day periods. (Woolridge at 33—34)

Q. WHAT DATA DOES DR. WOOLRIDGE CONSIDER FOR ESTIMATING THE EXPECTED FUTURE GROWTH COMPONENT OF THE DCF COST OF EQUITY?

A. Dr. Woolridge considers Value Line data on historical growth rates in earnings, dividends, and book value per share, as well as Value Line data on projected growth rates in earnings, dividends, and book value. For most of his proxy companies, Value Line's median historical growth rates are less than its projected growth rates, 4.4 percent versus 4.7 percent–4.8 percent. Dr. Woolridge also considers analysts' forecasts of future growth provided by Yahoo and Zacks, and prospective growth estimates based on Value Line's estimates of retention ratios and rates of return on book equity. (Woolridge at 39–40) Dr. Woolridge claims, however, that he gives primary weight to the projected growth rates of Wall Street analysts. (Woolridge at 41)

Q. DO YOU AGREE WITH DR. WOOLRIDGE'S USE OF HISTORICAL GROWTH RATES TO ESTIMATE INVESTORS' EXPECTATION OF FUTURE GROWTH IN THE DCF MODEL?

A. No. Historical growth rates are inherently inferior to analysts' growth forecasts because analysts' forecasts already incorporate all relevant information regarding historical growth rates and also incorporate the analysts' knowledge about current conditions and

expectations regarding the future. My studies, described in my direct testimony at pp. 27 – 28, indicate that investors use analysts' earnings growth forecasts in making stock buy and sell decisions rather than historical or internal growth rates such as those presented by Dr. Woolridge.

Q. DOES DR. WOOLRIDGE RECOGNIZE THE INHERENT PROBLEMS IN USING HISTORICAL GROWTH RATES TO ESTIMATE INVESTORS' EXPECTED FUTURE GROWTH IN THE DCF MODEL?

A. Yes. Dr. Woolridge recognizes the inherent problems in using historical growth rates when he states:

> However, one must use historical growth numbers as measures of investors' expectations with caution. In some cases, past growth may not reflect future growth potential. Also, employing a single growth rate number (for example, for five or 10 years) is unlikely to accurately measure investors' expectations, due to the sensitivity of a single growth rate figure to fluctuations in individual firm performance as well as overall economic fluctuations (i.e., business cycles). However, one must appraise the context in which the growth rate is being employed. According to the conventional DCF model, the expected return on a security is equal to the sum of the dividend yield and the expected long-term growth in dividends. Therefore, to best estimate the cost of common equity capital using the conventional DCF model, one must look to long-term growth rate expectations. (Woolridge at 36)

Q. WHAT IS THE INTERNAL GROWTH METHOD OF ESTIMATING THE GROWTH COMPONENT OF THE DCF COST OF EQUITY?

A. The internal growth method estimates expected future growth by multiplying a company's retention ratio, "b," times its expected rate of return on equity, "r." Thus, "g = b x r," where "g" is the growth rate, "b" is the percentage of earnings that are retained in the business, and "r" is the expected rate of return on equity.

Q. DO YOU AGREE WITH THE USE OF THE INTERNAL GROWTH METHOD TO ESTIMATE INVESTORS' EXPECTED FUTURE GROWTH IN THE DCF MODEL?

A. No. The internal growth method is logically circular because it requires an estimate of the expected rate of return on equity, "r," in order to estimate the cost of equity using the DCF model. Yet, for regulated companies such as DESC, the allowed rate of return on equity is set equal to the cost of equity.

Q. HOW DOES DR. WOOLRIDGE ESTIMATE THE EXPECTED RATE OF RETURN ON EQUITY FOR EACH PROXY COMPANY IN HIS SUSTAINABLE OR INTERNAL GROWTH ANALYSIS?

A. Dr. Woolridge uses Value Line's forecast of each company's rate of return on equity for the period 2017 – 2019 to the period 2023 – 2025 as his estimate of the expected rate of return on equity for each company. (Woolridge Exhibit JRW-7, p. 4)

Q. WHAT RATE OF RETURN ON EQUITY DOES DR. WOOLRIDGE ASSUME IN HIS CALCULATION OF EXPECTED GROWTH USING HIS INTERNAL GROWTH METHOD?

A. Dr. Woolridge assumes a median rate of return on equity equal to 10.5 percent for the Electric Proxy Group and 10.5 percent for the Vander Weide proxy group. (Woolridge Exhibit JRW-7, p. 4)

Q. IS IT REASONABLE TO ASSUME THAT DR. WOOLRIDGE'S PROXY COMPANIES WILL EARN A RATE OF RETURN ON EQUITY EQUAL TO 10.5 PERCENT WHEN HE IS RECOMMENDING THAT THEY BE ALLOWED TO EARN ONLY A RETURN OF 8.9 PERCENT?

A. No. Investors are aware that electric utilities are regulated by rate of return regulation. If investors truly believed that the utilities' cost of equity were equal to Dr. Woolridge's recommended 8.9 percent, they would forecast that the utilities would earn 8.9 percent on equity. Thus, Dr. Woolridge's recommended 8.9 percent rate of return on equity is inconsistent with his own assumed 10.5 percent earned rate of return on equity for the proxy groups.

Q. DOES DR. WOOLRIDGE'S INTERNAL GROWTH METHOD RECOGNIZE THAT, IN ADDITION TO GROWTH FROM RETAINED EARNINGS, THE COMPANIES IN HIS PROXY GROUP CAN ALSO GROW BY ISSUING NEW EQUITY AT PRICES ABOVE BOOK VALUE?

A. No. Dr. Woolridge's internal growth method underestimates the expected future growth of his proxy companies because it neglects the possibility that the companies can also grow by issuing new equity at prices above book value. Because all of the proxy companies are selling at prices in excess of book value, and Value Line forecasts that many of them will issue new equity over the next several years, Dr. Woolridge's failure to recognize the "external" component of future growth causes him to underestimate his proxy companies' expected future growth even more.

Q. DOES DR. WOOLRIDGE'S INTERNAL GROWTH METHOD RECOGNIZE THAT VALUE LINE'S REPORTED RATES OF RETURN ON EQUITY GENERALLY UNDERSTATE EACH COMPANY'S AVERAGE RATE OF RETURN ON EQUITY FOR THE YEAR?

A. No. Dr. Woolridge fails to recognize that Value Line calculates its reported rates of return on equity by dividing a company's net income by end-of-year equity, whereas most

financial analysts calculate a company's rate of return on equity by dividing net income by the average equity for the year. In the general case in the utility industry where a company's equity is increasing, Value Line's reported ROEs will understate the average ROE for the year. Thus, Dr. Woolridge's failure to recognize that Value Line's reported ROEs understate each company's average ROE for the year is an additional factor causing him to underestimate DESC's cost of equity.

Q. DO YOU AGREE WITH DR. WOOLRIDGE'S USE OF ANALYSTS' GROWTH FORECASTS TO ESTIMATE THE EXPECTED GROWTH COMPONENT OF HIS DCF MODEL?

A. Yes. As discussed in my direct testimony, I recommend the use of analysts' growth forecasts to estimate investors' expected growth in the DCF model. The DCF model requires the growth forecasts of investors, and there is considerable empirical evidence that investors use analysts' growth forecasts to estimate future earnings growth. (Vander Weide Direct at 26 – 28)

B. CAPITAL ASSET PRICING MODEL ANALYSIS

Q. WHAT IS THE CAPM?

A. The CAPM is an equilibrium model of expected returns on risky securities in which the expected or required return on a given risky security is equal to the risk-free rate of interest plus the security's "beta" times the market risk premium:

Expected return = Risk-free rate + (Security beta x Market risk premium).

The risk-free rate in this equation is the expected rate of return on a risk-free government security, the security beta is a measure of the company's risk relative to the market as a

whole, and the market risk premium is the premium investors require to invest in the market basket of all securities compared to the risk-free security.

Q. HOW DOES DR. WOOLRIDGE USE THE CAPM TO ESTIMATE DESC'S COST OF EQUITY?

A. The CAPM requires estimates of the risk-free rate, the company-specific risk factor, or beta, and either the required return on an investment in the market portfolio, or the risk premium on the market portfolio compared to an investment in risk-free government securities. For the risk-free rate, Dr. Woolridge uses an average 2.5 percent yield on 30-year Treasury bonds (Woolridge at 44); for the company-specific risk factor or beta, Dr. Woolridge uses the median Value Line beta for the proxy utility groups equal to 0.85 (Woolridge at 48); and for the risk premium on the market portfolio, Dr. Woolridge employs an average 6.0 percent risk premium he obtains from his review of the risk premium literature. (Woolridge at 56)

Q. WHAT CAPM RESULT DOES DR. WOOLRIDGE OBTAIN FOR HIS PROXY COMPANIES?

A. For both the Electric Proxy Group and for the Vander Weide proxy group, Dr. Woolridge obtains a CAPM result of 7.6 percent. (Woolridge at 56)

Q. DOES DR. WOOLRIDGE CONCLUDE THAT THE RESULT OF HIS CAPM ANALYSIS IS A REASONABLE ESTIMATE OF DESC'S COST OF EQUITY?

A. No. Dr. Woolridge reports results of 8.9 percent for his DCF studies and a result equal to 7.6 percent for his CAPM studies. (Woolridge at 57) From these results, Dr. Woolridge concludes that DESC's cost of equity is in a range of 7.6 percent to 8.9 percent. Despite asserting that the CAPM results are within the appropriate cost of equity range,

Dr. Woolridge specifically states that he gives primary weight to his DCF results to reach his final recommended equity cost rate of 8.9 percent. (Woolridge at 41)

Q. DO YOU AGREE WITH DR. WOOLRIDGE'S APPLICATION OF THE CAPM?

A. No, I believe that Dr. Woolridge's CAPM results are far below any reasonable estimate of DESC's cost of equity. A reasonable application of the CAPM produces results in the range 9.5 percent to 10.8 percent (see Exhibit No. ___ (JVW- 4 Rebuttal) and Exhibit No. __ (JVW-5 Rebuttal)

Q. DID YOU SUMMARIZE IN YOUR DIRECT TESTIMONY THE EVIDENCE THAT THE CAPM UNDERESTIMATES THE REQUIRED RETURNS FOR SECURITIES OR PORTFOLIOS WITH BETAS LESS THAN 1.0 AND OVERESTIMATES REQUIRED RETURNS FOR SECURITIES OR PORTFOLIOS WITH BETAS GREATER THAN 1.0?

A. Yes. I summarized this evidence in my direct testimony on pages 39 – 41.

C. DR. WOOLRIDGE'S COMMENTS ON THE RELATIONSHIP BETWEEN UTILITIES' RATE OF RETURN ON EQUITY AND THEIR MARKET-TO-BOOK RATIOS

Q. DOES DR. WOOLRIDGE DISCUSS THE RELATIONSHIP BETWEEN RATES OF RETURN ON EQUITY, THE COST OF EQUITY, AND MARKET-TO-BOOK RATIOS IN HIS TESTIMONY?

A. Yes. Dr. Woolridge asserts that a market-to-book ratio above 1.0 indicates that a company is earning more than its cost of equity:

> As such, the relationship between a firm's return on equity, cost of equity, and market-to-book ratio is relatively straightforward. A firm that earns a return on equity above its cost of equity will see its common stock sell at a price above its book value. Conversely, a firm that earns a return

on equity below its cost of equity will see its common stock sell at a price below its book value. [Woolridge at B-3]

Q. DOES DR. WOOLRIDGE PROVIDE ANY EVIDENCE THAT HE ASSERTS SUPPORTS HIS CLAIM THAT A MARKET-TO-BOOK RATIO ABOVE 1.0 INDICATES THAT A COMPANY IS EARNING MORE THAN ITS COST OF EQUITY?

Q. Yes. Dr. Woolridge reports the results of three regression analyses that he asserts support his claim that: (1) companies with market-to-book ratios greater than 1.0 are earning more than their costs of equity; (2) companies with market-to-book ratios equal to 1.0 are earning their costs of equity; and (3) companies with market-to-book ratios less than 1.0 are earning less than their costs of equity. (Woolridge at B-4)

Q. DOES DR. WOOLRIDGE'S REGRESSION ANALYSIS FOR HIS ELECTRIC UTILITIES PROVIDE ANY SUPPORT FOR THIS CLAIM?

A. No. Dr. Woolridge claims that: (1) the cost of equity for electric utilities like DESC is 8.9 percent; and (2) companies with ROEs less than the cost of equity will have market-to-book ratios less than 1.0. However, contrary to Dr. Woolridge's hypothesis, 14 of the 36 Value Line electric utilities in Dr. Woolridge's regression analysis have expected ROEs less than 8.9 percent, and none of these utilities have market-to-book ratios less than 1.0. With regard to the natural gas utilities in Dr. Woolridge's regression analysis, six of the ten Value Line natural gas utilities have expected ROEs less than 8.9 percent, and no company has a market-to-book ratio less than 1.0. These data, downloaded from Value Line on November 14, 2020, contradict Dr. Woolridge's claim that companies earning less than their cost of equity will have market-to-book ratios of less than 1.0. (The ROE market-

to-book data in Dr. Woolridge's work papers, which apparently include data at March 2019, differ significantly from the data in Value Line at November 2020.)

D. RESPONSE TO DR. WOOLRIDGE'S COMMENTS ON DR. VANDER WEIDE TESTIMONY

Q. WHAT ISSUES DOES DR. WOOLRIDGE HAVE WITH THE RATE OF RETURN EVIDENCE YOU PRESENT IN YOUR DIRECT TESTIMONY?

A. Dr. Woolridge disagrees with my: (1) DCF analysis; (2) risk premium analysis; (3) CAPM analysis; (4) comparable earnings analysis; and (5) capital structure analysis. (Woolridge at 59—63)

1. DCF ANALYSIS

Q. WHAT ARE DR. WOOLRIDGE'S CRITICISMS OF YOUR DCF STUDIES?

A. Dr. Woolridge claims that I should: (1) use the annual rather than the quarterly DCF model to estimate DESC's cost of equity; (2) use a combination of historical and analysts' growth rates to estimate the growth component of the DCF model; (3) make no allowance for flotation costs; and (4) make no adjustment for the difference between the financial risk reflected in my cost of equity estimate and the financial risk reflected in DESC's rate making capital structure.

Q. WHAT IS THE MAJOR DIFFERENCE BETWEEN THE QUARTERLY DCF MODEL WHICH YOU USE AND THE ANNUAL DCF MODEL EMPLOYED BY DR. WOOLRIDGE?

A. The major difference is that my quarterly DCF model is based on the realistic assumption that dividends are paid quarterly, while Dr. Woolridge's annual DCF model is based on the unrealistic assumption that dividends are paid once at the end of each year.

Q. WHY DO YOU USE THE QUARTERLY RATHER THAN THE ANNUAL DCF MODEL TO ESTIMATE DESC'S COST OF EQUITY?

A. As I discuss in my direct testimony, the DCF model assumes that a company's stock price is equal to the present discounted value of all expected future dividends. Because the companies in my proxy group all pay dividends quarterly, the current market price that investors are willing to pay reflects the expected quarterly receipt of dividends. Therefore, a quarterly DCF model must be used to estimate the cost of equity for these firms. The quarterly DCF model differs from the annual DCF model in that it expresses a company's stock price as the present discounted value of a quarterly stream of dividend payments. The annual DCF model is only a correct expression for the present discounted value of future dividends if dividends are paid once at the end of each year.

Q. WHY DOES DR. WOOLRIDGE DISAGREE WITH YOUR APPLICATION OF THE QUARTERLY DCF MODEL?

A. Dr. Woolridge asserts that the quarterly DCF model is not required because: (1) 'the appropriate dividend yield adjustment for growth in the DCF model is the expected dividend for the next quarter multiplied by four;" (Woolridge at 70) and (2) the "notion that an adjustment is required to reflect the quarterly timing issue is refuted in a study by Richard Bower of Dartmouth College." (Woolridge at 70)

Q. DO YOU AGREE WITH DR. WOOLRIDGE'S STATEMENT THAT "THE APPROPRIATE DIVIDEND YIELD ADJUSTMENT FOR GROWTH IN THE DCF MODEL IS THE EXPECTED DIVIDEND FOR THE NEXT QUARTER MULTIPLIED BY FOUR"?

A. No. Dr. Woolridge's assertion is incorrect because it ignores the time value of quarterly dividend payments over the course of a year, and he provides no justification for his assertion. In contrast, I explain in detail in Exhibit No. __ (JVW-3) of my direct testimony how to appropriately adjust for the quarterly payment of dividends in the application of the DCF model.

Q. DO YOU AGREE WITH DR. WOOLRIDGE'S ASSERTION THAT DR. BOWER'S STUDY "REFUTES" THE "NOTION THAT AN ADJUSTMENT IS REQUIRED TO REFLECT THE QUARTERLY TIMING" OF DIVIDEND PAYMENTS IN THE DCF MODEL?

A. No. Indeed, the Bower study in fact confirms the downward bias of the annual DCF model. However, Dr. Bower asserts that an annual DCF model is reasonable because utilities "survive," even without adjusting for the quarterly payment of dividends.

Q. IS DR. BOWER'S STATEMENT IN FAVOR OF AN ANNUAL DCF MODEL A REASONABLE JUSTIFICATION FOR USING THE ANNUAL DCF MODEL IN THIS PROCEEDING?

A. No. Dr. Bower's assertion that "too many utilities have survived and sustained market prices above book" provides no financial or statistical refutation of the downward bias to the annual DCF model. As shown in Exhibit No. __ (JVW-3) in my direct testimony, there can be no doubt that when dividends are paid quarterly, the quarterly DCF model must be used to estimate the cost of equity.

Q. DO YOU AGREE WITH DR. WOOLRIDGE'S ASSERTION THAT THE QUARTERLY DCF MODEL ALLOWS INVESTORS TO EARN MORE THAN THEIR REQUIRED RETURN ON EQUITY?

A. No. The quarterly DCF model does not allow investors to earn more than their required return on equity; it simply offers a better estimate of investors' required return on equity than an annual DCF model. Whether a company earns more than its cost of equity depends on many factors, including the state of the economy and the demand for electricity, factors which cannot be known at the time the cost of equity is being estimated. Moreover, the Commission has many tools at its disposal to prevent overearning, one of which is monitoring reports that allow the Commission and ORS to be informed regularly about a utility's earnings in comparison to its authorized return.

Q. DR. WOOLRIDGE ALSO CRITICIZES YOUR USE OF ANALYSTS' GROWTH RATES IN YOUR DCF MODEL. WHY DO YOU USE ANALYSTS' GROWTH RATES TO ESTIMATE THE GROWTH COMPONENT OF THE DCF MODEL?

A. I use analysts' growth rates because my studies indicate that the analysts' growth rates are highly correlated with stock prices. This evidence provides strong support for the conclusion that investors use analysts' growth rates in making stock buy and sell decisions, and thus the analysts' growth rates should be used to estimate the growth component of the DCF model. I also note that Dr. Woolridge himself gave "primary weight" to analysts' growth forecasts in his testimony in this proceeding. (Woolridge at 41)

Q. DOES DR. WOOLRIDGE AGREE WITH YOUR STATISTICAL STUDIES OF THE RELATIONSHIP BETWEEN ANALYSTS' GROWTH RATES AND STOCK PRICES?

A. No. Dr. Woolridge has four criticisms of my statistical studies of the relationship between analysts' growth rates and stock prices. First, he argues that my statistical study is outdated. Second, he argues that my study is misspecified because I used a "linear approximation"

to the DCF model rather than a modified version of the DCF model. Third, he argues that I did not use both historical and analysts' forecasted growth rates in the same regression. Fourth, he argues that I did not perform any tests to determine if the difference between historic and projected growth measures is statistically significant. (Woolridge at 74–75)

Q. DO YOU AGREE WITH DR. WOOLRIDGE'S ASSERTION THAT YOUR STATISTICAL ANALYSIS OF THE RELATIONSHIP BETWEEN ANALYSTS' GROWTH RATES AND STOCK PRICES IS OUTDATED?

A. No. As discussed in my direct testimony, my study was updated by State Street Financial. The updated study continues to support the conclusion that the analysts' growth rates are more highly correlated with stock prices than historical measures such as those employed by Dr. Woolridge. Furthermore, Dr. Woolridge ignores other studies that have corroborated my results, and his own study does not support his criticism of the use of analysts' forecasts in applying the DCF model.

Q. DO YOU AGREE WITH DR. WOOLRIDGE'S CRITICISM THAT YOUR DCF MODEL IS MISSPECIFIED BECAUSE YOU USED A "LINEAR APPROXIMATION" TO THE DCF MODEL RATHER THAN A MODIFIED VERSION OF THE DCF MODEL?

A. No. Most regression analyses are based on the assumption that the relationship between the variables being studied is linear. As part of my studies, I tested whether the linear assumption was sufficiently close to provide reliable estimates of the model parameters. Applying a first order Taylor-series approximation to the DCF equation, I found that the first order, or linear, approximation was sufficiently close to the true equation to justify

using linear regression analysis to study the relationship between price/earnings ratios and growth rates.

Q. IS THERE A STATISTICALLY SIGNIFICANT DIFFERENCE BETWEEN THE ABILITY OF HISTORICAL AND PROJECTED GROWTH RATE MEASURES TO EXPLAIN STOCK PRICES IN YOUR STUDY?

A. Yes. The difference in the performance of historical and projected growth rates is both large and statistically significant.

Q. DR. WOOLRIDGE CLAIMS IN HIS TESTIMONY THAT IT IS WELL KNOWN THAT THE LONG-TERM EPS GROWTH RATE FORECASTS OF WALL STREET SECURITIES ANALYSTS "ARE OVERLY OPTIMISTIC AND UPWARDLY BIASED." (WOOLRIDGE AT PP. 10, 61, 69, AND 77) IS HE CORRECT?

A. No. Contrary to Dr. Woolridge's claim, the academic literature presents compelling evidence that analysts' EPS growth forecasts are unbiased—that is, neither optimistic nor pessimistic. I have reviewed nine articles that address whether analysts' growth forecasts are overly optimistic. At least seven of the nine articles reviewed find no evidence that analysts' growth forecasts are overly optimistic. Two find evidence of optimism in the early years of the study, but also conclude that optimism is not present in the later years of the study. In fact, one study finds that analysts' forecasts for the S&P 500 are pessimistic for the last four years of the study. (See Table 2 below and Exhibit No.__ (JVW-7Rebuttal)

TABLE 2
ARTICLES THAT STUDY WHETHER ANALYSTS' FORECASTS ARE BIASED TOWARD OPTIMISM

Author (Date)	*Conclusion*
Crichfield, Dyckman, and Lakonishok (1978)	Unbiased
Elton, Gruber, and Gultekin (1984)	Unbiased
Givoly and Lakonishok (1984)	Unbiased
Brown (1997)	Declining optimism
Keane and Runkle (1998)	Unbiased
Abarbanell and Lehavy (2003)	Unbiased
Ciccone (2005)	Pessimistic
Clarke, Ferris, Jayaraman, and Lee (2006)	Unbiased
Yang and Mensah (2006)	Unbiased

Q. DOES SOME OF THE LATER RESEARCH EXPLAIN WHY SOME EARLIER STUDIES IN THE LITERATURE CONCLUDE THAT ANALYSTS' EPS GROWTH FORECASTS ARE OPTIMISTIC?

A. Yes. Articles by Abarbanell and Lehavy (2003) and Keane and Runkle (1998) recognize that the results of earlier studies are heavily influenced by: (1) the inclusion of large unexpected accounting write-offs and special accounting charges in reported earnings; and (2) the impact of high correlation in analysts' forecasts. These articles conclude that once the statistical problems associated with the inclusion of non-recurring earnings in reported earnings per share and correlations in analysts' forecasts are corrected, the evidence supports the conclusion that analysts' forecasts are unbiased, and hence, not optimistic.

Q. DR. WOOLRIDGE DISCUSSES THE RESULTS OF HIS OWN STUDY OF THE RELATIONSHIP BETWEEN ANALYSTS' FORECASTS FOR UTILITIES AND THE UTILITIES' SUBSEQUENT ACHIEVED EARNINGS GROWTH RATES IN HIS PAPER PROVIDED WITH HIS WORKPAPERS (PATRICK CUSATIS, CFA AND J. RANDALL WOOLRIDGE, "THE ACCURACY OF ANALYSTS' LONG-

TERM EARNINGS PER SHARE GROWTH FORECASTS," JANUARY 24, 2008). DO YOU HAVE ANY COMMENTS ON HIS STUDY?

A. Yes. First, Dr. Woolridge has misspecified the time frame of his analysts' earnings growth forecasts. In his study, Dr. Woolridge claims that he compares the analysts' EPS forecast made in a particular quarter to the company's realized earnings growth rate in the *same* quarter four years hence. In making this comparison, Dr. Woolridge fails to recognize that: (1) the time frame of the analysts' growth forecast is an indefinite, long-run period that may differ from one analyst to another; (2) quarterly realized earnings are unaudited; and (3) quarterly realized earnings are subject to seasonality. Dr. Woolridge has provided no evidence that analysts' growth estimates were intended to forecast actual results for exactly the same quarter four years hence.

Second, Dr. Woolridge has not distinguished between recurring and non-recurring earnings. The analysts' growth forecasts are intended to be applied only to growth in recurring earnings, meaning that they are forecasts of earnings in the absence of extraordinary events and one-time write-offs. It is likely that the forecast deviations in Dr. Woolridge's sample are due primarily to the impact of extraordinary events and one-time write-offs rather than to problems with the analysts' forecasts of recurring earnings.

Third, Dr. Woolridge fails to adjust for the extremely high correlation in analysts' forecasts across companies. Financial researchers have conclusively demonstrated that there is no evidence of analysts' optimism in data sets that are properly adjusted for the impact of one-time accounting write-offs and the correlation in analysts' forecasts across companies. (*See* Jeffery Abarbanell and Reuven Lehavy, "Biased Forecasts or Biased Earnings? The Role of Reported Earnings in Explaining Apparent Bias and

Over/underreaction in Analysts' Earnings Forecasts," *Journal of Accounting and Economics,* 36 (2003) 105 – 146; and Stephen J. Ciccone, "Trends in Analyst Earnings Forecast Properties," *International Review of Financial Analysis*, 14 (2005) 1 – 22)

Q. WHY DO ANALYSTS EXCLUDE NON-RECURRING EARNINGS FROM EARNINGS GROWTH FORECASTS?

A. Analysts exclude non-recurring earnings from earnings growth forecasts because stock prices reflect the impact of expected future earnings and, by definition, non-recurring earnings or losses are not expected to continue in the future. Because non-recurring earnings do not, in theory, impact stock prices, analysts do not include them in their earnings growth forecasts. In addition, because accounting adjustments are somewhat discretionary, it is virtually impossible to forecast the timing and magnitude of such adjustments, certainly when the long-term earnings per share forecast is intended to apply to a period three to five years in the future.

Q. DO YOU HAVE EVIDENCE THAT NON-RECURRING ITEMS CAN HAVE A SIGNIFICANT IMPACT ON THE REPORTED EARNINGS PER SHARE FOR ELECTRIC UTILITIES?

A. Yes. The impact of non-recurring items on reported earnings per share for electric utilities can be estimated from annual data on aggregate earnings per share for electric utilities, including and excluding non-recurring items, published by The Edison Electric Institute in its annual financial report on investor-owned electric utilities. As shown in Table 3 below, aggregate EPS including non-recurring items (that is, EPS as reported) is generally less than aggregate EPS excluding non-recurring items; and, in many years, the difference is substantial. Indeed, EPS that include non-recurring items understates EPS that excludes

non-recurring items by 16 percent on average over the study period. Thus, Dr. Woolridge's use of EPS data that include non-recurring items would have had a significant impact on his conclusion that analysts' forecasts are optimistic.

TABLE 3
EARNINGS PER SHARE ("EPS") INCLUDING AND EXCLUDING NON-RECURRING ITEMS
U.S. INVESTOR-OWNED ELECTRIC UTILITIES
1992 – 2007

Year	EPS Including Non-Recurring	EPS Excluding Non-Recurring	Difference (Excluded – Included)	PERCENT CHANGE
1992	$ 1.66	$ 1.85	$ 0.19	10%
1993	$ 1.65	$ 1.99	$ 0.34	17%
1994	$ 1.92	$ 1.96	$ 0.04	2%
1995	$ 2.10	$ 2.11	$ 0.01	0%
1996	$ 2.14	$ 2.21	$ 0.07	3%
1997	$ 1.49	$ 2.01	$ 0.52	26%
1998	$ 1.52	$ 1.79	$ 0.27	15%
1999	$ 2.04	$ 2.05	$ 0.01	0%
2000	$ 1.59	$ 2.47	$ 0.88	36%
2001	$ 2.43	$ 2.93	$ 0.50	17%
2002	$ (0.04)	$ 2.40	$ 2.44	102%
2003	$ 1.45	$ 2.20	$ 0.75	34%
2004	$ 2.23	$ 2.00	$ (0.23)	-12%
2005	$ 2.09	$ 2.28	$ 0.19	8%
2006	$ 2.42	$ 2.37	$ (0.05)	-2%
2007	$ 2.65	$ 2.34	$ (0.31)	-13%
Average		**$ 34.96**	**$ 5.62**	**16%**

2. RISK PREMIUM ANALYSIS

Q. WHAT IS THE RISK PREMIUM APPROACH TO ESTIMATING THE COST OF EQUITY?

A. The risk premium approach is based on the principle that investors expect to earn a return on an equity investment in DESC that reflects a "premium" over and above the return they

expect to earn on an investment in a portfolio of long-term bonds. This equity risk premium compensates equity investors for the additional risk they bear in making equity investments versus bond investments. Using the risk premium approach, the cost of equity is given by the following equation: cost of equity = interest rate plus risk premium.

Q. HOW DO YOU ESTIMATE THE INTEREST RATE COMPONENT OF THE RISK PREMIUM APPROACH?

A. I estimate the interest rate component of the risk premium approach using the yield to maturity on A-rated utility bonds.

Q. DOES DR. WOOLRIDGE HAVE ANY CRITICISMS OF YOUR USE OF THE YIELD TO MATURITY ON A-RATED UTILITY BONDS TO ESTIMATE THE INTEREST RATE COMPONENT OF THE RISK PREMIUM APPROACH?

A. Yes. Dr. Woolridge argues that my use of the yield to maturity on A-rated utility bonds inflates the required return on equity because long-term utility bonds are not risk free, that is, they are subject to both interest rate risk and credit risk. (Woolridge at 76–77)

Q. DO YOU AGREE WITH DR. WOOLRIDGE'S CRITICISM OF YOUR USE OF THE YIELD TO MATURITY ON A-RATED UTILITY BONDS TO ESTIMATE THE INTEREST RATE COMPONENT OF THE RISK PREMIUM APPROACH?

A. No. Dr. Woolridge fails to recognize that the risk premium approach does not require that the interest rate be "risk free." Indeed, the only requirement of the risk premium approach is that the same interest rate be used to estimate the interest rate component as is used to estimate the risk premium component. Because the risk premium approach suggests that the cost of equity equals (the interest rate) plus (the risk premium as measured by the required return on equity minus the interest rate), the cost of equity should be

approximately the same in a risk premium analysis, no matter what interest rate is used as the benchmark interest rate. Thus, use of the interest rate on A-rated utility bonds in a risk premium analysis will produce a higher interest rate component than use of a government bond interest rate, but this difference will be offset by the correspondingly lower risk premium. The lower risk premium arises because the difference between the return on equity and yield on A-rated utility bonds is less than the difference between the return on equity and the yield on long-term government bonds.

Q. WHY DO YOU USE THE YIELD ON A-RATED UTILITY BONDS RATHER THAN THE YIELD ON TREASURY BONDS IN YOUR RISK PREMIUM STUDIES?

A. I use the yield on A-rated utility bonds rather than the yield on Treasury bonds in my risk premium studies because I believe that utility bond yields are better indicators of a utility's cost of equity than Treasury bond yields. First, because the U.S. dollar is the major currency for international trade, foreign governments tend to hold their currency reserves in U.S. Treasury bonds. Thus, Treasury bond yields are highly sensitive to changes in international economic conditions, whereas the U.S. utilities' cost of equity is not.

Second, because U.S. Treasuries are considered to be the safest investment in the world, investors across the world tend to flock to investments in U.S. Treasuries at times of widespread global economic turmoil. In periods of turmoil, the required return on risky investments such as utility bonds and stocks increases while the yield on U.S. Treasury bonds declines. Thus, changes to U.S. Treasury bond yields are poor indicators of changes in a utility's cost of equity.

Third, yields on U.S. Treasury bonds are highly sensitive to efforts by the Federal Reserve to stimulate the economy. Although most Federal Reserve monetary policy operations are conducted using short-term U. S. Treasury bills, yields on long-term Treasury bonds frequently move in the same direction as yields on short-term Treasury bills

Fourth, to the extent that there are economic developments that are specific to the utility industry, such as changes in environmental regulations and energy policy, such factors will be reflected both in utility bond yields and the utility cost of equity, but not in U.S. Treasury bond yields. Thus, that utility bond yields reflect utility-specific risks is an argument for—not an argument against—the use of utility bond yields to indicate changes in the utility cost of equity.

Q. HOW DO YOU ESTIMATE THE RISK PREMIUM COMPONENT OF THE RISK PREMIUM APPROACH?

A. I estimate the risk premium component of the risk premium approach in two ways. First, I estimate the difference between the DCF cost of equity for a proxy group of companies over the previous 249 months and the concurrent yield to maturity on A-rated utility bonds in those months, and then adjust the average risk premium to account for changes in interest rates. This first estimate is my "ex ante risk premium approach." Second, I estimate the risk premium from an historical study of stock and bond returns over the period 1937 to the present. This second risk premium approach is my "ex post risk premium approach."

Q. WHY DOES DR. WOOLRIDGE CRITICIZE YOUR EX ANTE RISK PREMIUM APPROACH?

A. Dr. Woolridge criticizes my ex ante risk premium approach because it relies on analysts' forecasts to estimate the required return on equity using the DCF model.

Q. HAVE YOU ADDRESSED DR. WOOLRIDGE'S CRITICISMS OF YOUR USE OF ANALYSTS' GROWTH FORECASTS ELSEWHERE IN THIS REBUTTAL TESTIMONY?

A. Yes, I have. (See Section II., D., 1 above.) Furthermore, as I also note above, regardless of his criticism, Dr. Woolridge recommends using analysts' long-term growth estimates in his recommended DCF result.)

Q. DOES DR. WOOLRIDGE AGREE WITH YOUR USE OF HISTORICAL STOCK AND BOND RETURNS TO ESTIMATE THE EQUITY RISK PREMIUM?

A. No. Dr. Woolridge states:

> Among the errors are the US stock market survivorship bias (the "Peso Problem"), the company survivorship bias (only successful companies survive), the measurement of central tendency (arithmetic versus geometric mean), the historical time horizon used, the change in risk and required return over time, the downward bias in historical bond returns, and unattainable return bias. (Woolridge at 79)

Q. DO YOU AGREE WITH DR. WOOLRIDGE'S STATEMENT THAT HISTORICAL BOND RETURNS ARE BIASED DOWNWARD?

A. No. Because of capital gains and losses, historical bond returns may be higher or lower than what investors expected at the time they purchased the bonds. During the period since 1982, for example, historical bond returns have been biased upward as a measure of expectancy because of the large capital gains achieved by bondholders over this period. However, over the entire period considered in my ex post risk premium study (from 1937 to the present), capital gains and losses on bonds have approximately offset each other, and consequently there is no significant bias as a result from either capital gains or losses.

Q. WHAT IS THE DIFFERENCE BETWEEN AN ARITHMETIC AND A GEOMETRIC MEAN RETURN?

A. An arithmetic mean return is an additive return that is calculated by summing the achieved return in each time period and dividing the total by the number of periods. In contrast, the geometric mean return is a multiplicative return that is calculated in two steps. First, one calculates the product of (1 plus the return) in each period of the study. Second, one calculates the n^{th} root of this product and subtracts 1 from the result. Thus, if there are two periods, and r_1 and r_2 are the returns in periods one and two, respectively, the arithmetic mean is calculated from the equation: $a_m = (r_1 + r_2) \div 2$. The geometric mean is calculated from the equation,

$$a_g = [(1 + r_1) \times (1 + r_2)]^{.5} - 1.$$

Q. PLEASE DESCRIBE DR. WOOLRIDGE'S CONCERN REGARDING THE USE OF ARITHMETIC VERSUS GEOMETRIC MEAN RETURNS.

A. Dr. Woolridge believes that my ex post risk premium study is biased because I calculate the expected risk premium using the arithmetic mean of past returns, whereas he believes I should have calculated the expected risk premium using the geometric mean of past returns.

Q. IS DR. WOOLRIDGE'S CRITICISM VALID?

A. No. As explained in Ibbotson® SBBI® Valuation Edition 2013 Yearbook (SBBI®), for example, the arithmetic mean return is the best approach for calculating the return investors expect to receive in the future:

> The equity risk premium data presented in this book are arithmetic average risk premia as opposed to geometric average risk premia. The arithmetic average equity risk premium can be demonstrated to be most

> appropriate when discounting future cash flows. For use as the expected equity risk premium in either the CAPM or the building block approach, the arithmetic mean or the simple difference of the arithmetic means of stock market returns and riskless rates is the relevant number. This is because both the CAPM and the building block approach are additive models, in which the cost of capital is the sum of its parts. The geometric average is more appropriate for reporting past performance, since it represents the compound average return. [SBBI® at 56]

A discussion of the importance of using arithmetic mean returns in the context of CAPM or risk premium studies is contained in my direct testimony, Exhibit No. __ (JVW-12), "Using the Arithmetic Mean to Estimate the Cost of Equity Capital."

Q. DR. WOOLRIDGE ALSO CRITICIZES YOUR EX POST RISK PREMIUM STUDY BECAUSE IT IS BASED ON "UNATTAINABLE RETURN BIAS." (WOOLRIDGE AT 79) IS HIS CRITICISM VALID?

A. No. Dr. Woolridge bases his allegation on the assumption that stock index returns such as those reported by Ibbotson® SBBI® are "unattainable." Dr. Woolridge's assumption is false: investors, in fact, can attain the returns achieved by stock indices simply by purchasing the stock index.

Q. DO YOU AGREE WITH DR. WOOLRIDGE'S CRITICISM THAT YOUR EX POST RISK PREMIUM STUDY IS CHARACTERIZED BY "SURVIVORSHIP BIAS"? (WOOLRIDGE AT 79)

A. No. Survivorship bias refers to problems that might arise when data for companies that have failed are excluded from the sample. However, with regard to the U.S. markets that I study, survivorship bias is not a major issue. First, over the period 1937 to the present, there have been relatively few companies in the S&P 500 and the S&P Utilities that have failed. Second, the S&P 500 includes the return on a stock until the day it is dropped from the index, and the effect of a company being dropped from the S&P 500 is generally anticipated

by the market well in advance of the delisting. Thus, survivorship is not a material issue with respect to U.S. stocks.

Q. WHAT DOES DR. WOOLRIDGE MEAN WHEN HE REFERS TO THE "PESO PROBLEM"? (WOOLRIDGE AT 79)

A. Dr. Woolridge uses the term "peso problem" to refer to the fact that U.S. investors have earned higher returns on stock investments than investors in other countries because the U.S. economy has not suffered many of the same economic calamities as the economies of other countries. This criticism of the use of U. S. stock returns in risk premium studies might be appropriate if one were attempting to estimate the expected rates of return on non-U. S. stocks. However, for U. S. stocks, because there is no indication that the U. S. will suffer the economic calamities of other countries, such as hyper-inflation or military invasion, there is no reason why the returns on U. S. stocks would be biased upward.

Q. DR. WOOLRIDGE ASSERTS THAT YOUR RISK PREMIUM ESTIMATE IS UNREASONABLE BECAUSE IT IS HIGHER THAN THE RISK PREMIUM ESTIMATE FOUND IN "SURVEYS OF FINANCIAL PROFESSIONALS." (WOOLRIDGE AT 87) DO YOU AGREE THAT SURVEYS OF FINANCIAL MANAGERS PROVIDE USEFUL INFORMATION ON THE EXPECTED MARKET RISK PREMIUM?

A. No. Surveys of business managers provide little or no information on the expected market risk premium because: (1) managers have no incentive to take the survey seriously; (2) their responses are not typically based on market transactions or actual investment decisions; (3) their responses may reflect what they think the investigator wants to hear; and (4) the response rate is frequently low.

Q. ONE OF THE SOURCES CITED BY DR. WOOLRIDGE IS THE GRAHAM AND HARVEY SURVEY OF CHIEF FINANCIAL OFFICERS. (WOOLRIDGE AT 51, EXHIBIT JRW-8). DO GRAHAM AND HARVEY PROVIDE INFORMATION ON THE WEIGHTED AVERAGE COST OF CAPITAL AND HURDLE RATES THAT COMPANIES ACTUALLY USE TO MAKE REAL WORLD INVESTMENT DECISIONS?

A. Yes. Graham and Harvey state that executives report that their firms use actual weighted average costs of capital in the range 9.3 percent to 9.7 percent, and they report that they use investment hurdle rates in the range 13.1 percent to 14.2 percent. Graham and Harvey's reported information on the WACCs and hurdle rates actually used by executives to make investment decisions is more relevant to assessing DESC's cost of equity than the information on executives' views on expected returns on the S&P 500.

Q. YOU NOTE THAT THE GRAHAM AND HARVEY SURVEY INDICATES THAT EXECUTIVES USE WEIGHTED AVERAGE COSTS OF CAPITAL IN THE RANGE 9.3 PERCENT TO 9.7 PERCENT TO MAKE REAL WORLD INVESTMENT DECISIONS. CAN YOU PROVIDE AN INDICATION OF THE MAGNITUDE OF THE COST OF EQUITY ASSOCIATED WITH WEIGHTED AVERAGE COSTS OF CAPITAL IN THE RANGE 9.3 PERCENT TO 9.7 PERCENT?

A. Yes. A company's weighted average cost of capital is a weighted average of its cost of debt and its cost of equity, where the weights are the percentages of debt and equity in the company's capital structure. If a company has a cost of debt equal to 5 percent and a capital structure containing 50 percent debt and 50 percent equity, in that case, the cost of equity

must be in the range 13.6 percent to 14.4 percent when the weighted average cost of capital is in the range 9.3 percent to 9.7 percent.

TABLE 4
COST OF EQUITY ESTIMATE
WHEN THE WEIGHTED AVERAGE COST OF CAPITAL
IS IN THE RANGE 9.3 PERCENT – 9.7 PERCENT, COST OF DEBT IS EQUAL TO 5 PERCENT, AND CAPITAL STRUCTURE EQUALS 50 PERCENT DEBT/50 PERCENT EQUITY

	COST RATE	% OF TOTAL	WEIGHTED COST
Debt	5.0%	50.0%	2.5%
Equity	13.6%	50.0%	6.8%
Total			9.3%
Debt	5.0%	50.0%	2.5%
Equity	14.4%	50.0%	7.2%
Total			9.7%

Q. WHAT ARE THE IMPLICATIONS OF THE EVIDENCE THAT EXECUTIVES USE ACTUAL WACCS IN THE RANGE 9.3 PERCENT TO 9.7 PERCENT AND INVESTMENT HURDLE RATES IN THE RANGE 13.1 PERCENT TO 14.2 PERCENT TO MAKE REAL WORLD INVESTMENT DECISIONS?

A. Because both the weighted average cost of capital and the hurdle rate are weighted averages of the cost of debt and the cost of equity, and the cost of debt is less than the cost of equity, the costs of equity that executives actually use in making real world investment decisions are likely to be in the range 13 percent to 15 percent. Thus, based on this evidence, the market risk premium is considerably higher than Dr. Woolridge's assumed 6 percent; and the cost of equity is considerably higher than Dr. Woolridge's calculated 7.6 percent CAPM cost of equity using a 6 percent market risk premium.

Q. WHY IS IT MORE RELEVANT TO FOCUS ON THE WEIGHTED AVERAGE COSTS OF CAPITAL AND COSTS OF EQUITY ACTUALLY USED BY EXECUTIVES TO MAKE INVESTMENT DECISIONS?

A. It is more relevant to focus on the weighted average costs of capital and costs of equity executives actually use to make real world investment decisions because executives have a high incentive to use their best estimates when real dollars are at risk.

3. FLOTATION COSTS

Q. WHY DO YOU INCLUDE AN ADJUSTMENT FOR FLOTATION COSTS IN YOUR DCF ANALYSIS?

A. I include an adjustment for flotation costs because, without such an adjustment, DESC would not be able to recover all the costs it incurs to finance its investments in electric plant and equipment.

Q. DOES DESC ISSUE EQUITY IN THE CAPITAL MARKETS?

A. No. Although DESC does not issue equity in the capital markets, its parent must issue equity to provide DESC the necessary financing to make investments in its electric utility operations in South Carolina. If the parent is not able to recover its flotation costs through DESC's rates, it will not be able to recover the full cost of issuing equity required to invest in DESC.

Q. DOES DR. WOOLRIDGE AGREE WITH YOUR FLOTATION COST ADJUSTMENT?

A. No. Dr. Woolridge claims that a flotation cost adjustment is inappropriate because: (1) the company has not presented any evidence that it actually incurs flotation costs when it issues new equity; and (2) it is frequently asserted that a flotation cost adjustment is required to

prevent dilution of the company's existing shareholders, but existing shareholders cannot suffer dilution as long as the company's stock price is above book value. (Woolridge 66 – 67)

Q. DO YOU AGREE WITH DR. WOOLRIDGE'S ASSERTION THAT THE COMPANY DID NOT PROVIDE ANY EVIDENCE THAT IT INCURS FLOTATION COSTS WHEN IT ISSUES NEW EQUITY?

A. No. In Exhibit No. __ (JVW-5) to my direct testimony, I present evidence that *all* companies incur flotation costs when they issue new equity securities, that flotation costs represent approximately five percent of the company's pre-issue stock price, and that the company will not be able to earn a fair rate of return on its investment if it does not recover its flotation costs.

Q. DO YOU JUSTIFY FLOTATION COSTS ON THE GROUNDS THAT FLOTATION COSTS ARE REQUIRED TO PREVENT DILUTION OF EXISTING SHAREHOLDERS?

A. No. I justify flotation costs on the grounds that the company will not be able to earn a fair rate of return if it does not recover the flotation costs it incurs when it issues new equity. My flotation cost adjustment is completely unrelated to the company's market-to-book ratio.

Q. WHAT IS THE ECONOMIC BASIS OF YOUR RECOMMENDED FLOTATION COST ALLOWANCE?

A. My recommended flotation cost allowance is based on the fundamental economic and regulatory principles that: (1) a company should only invest in a new project if it can earn a return on its investment that is equal to or greater than its cost of capital; and (2) the time

pattern of expense recovery should match the time pattern of benefits resulting from the expense. Because equity flotation costs are a legitimate expense of raising capital, a company has no incentive to invest in new capital projects if equity flotation costs are not included in the cost of capital estimate. In addition, because the proceeds of an equity issuance are invested in assets that provide benefits over a long time period, the costs of an equity issuance should be recovered over a long period of time.

Q. CAN YOU ILLUSTRATE HOW THIS ECONOMIC PRINCIPLE SUPPORTS YOUR RECOMMENDED FLOTATION COST ALLOWANCE?

A. Yes. Suppose that a company incurs a five percent flotation cost expense on each equity issuance. As a result of the five percent flotation cost expense, the company will only be able to invest $95 in new projects for each $100 of equity it issues in the capital markets. If investors require a ten percent return on their $100 equity investment in the company, the company will have to earn $10 on its $95 investment in new projects in order to earn a ten percent return for its investors. Thus, the presence of flotation costs has increased the required return on new projects from ten percent to 10.53 percent ($10/$95 = 10.53 percent).

Q. CAN YOU ILLUSTRATE HOW THIS ECONOMIC PRINCIPLE SUPPORTS YOUR RECOMMENDED FLOTATION COST ALLOWANCE IN A REGULATED COMPANY'S ALLOWED RETURN ON EQUITY?

A. Yes. My illustration of how this economic principle supports my recommendation to include a flotation cost allowance in a regulated company's allowed return on equity is shown below in Table 5. As shown in Table 5, a regulated company that experiences a five percent flotation cost is able to recover its five percent flotation cost under my

recommendation by earning a higher return on rate base than investors require on their investment in the company's stock. The difference between the company's earnings at a 10.26 percent allowed ROE and its 10.0 percent investor required return represents the amortization of the company's initial five percent ($5) flotation cost. If the Commission were to allow the company to recover its flotation cost as a current year expense, there would be no amortization of the company's flotation costs, and the company would recover its $5 flotation cost entirely in year one. Under my recommendation to include an allowance for flotation costs in the cost of equity, the $5 of flotation costs are recovered slowly over time. The first-year amortization of the flotation cost is only twenty-five cents, and the company would not recover the present value of its flotation costs until year 150. Thus, although my recommendation fulfills the *Hope* standard that investors be allowed to earn a fair return on their investment over the life of the investment, the customers who benefit from the additional equity investment in the company's assets are charged for the initial flotation cost only over a long period of time.

TABLE 5
ILLUSTRATION OF THE RECOVERY OF EQUITY FLOTATION COSTS
WHEN EQUITY FLOTATION COSTS ARE INCLUDED IN THE COST OF EQUITY

ANNUAL TIME PERIOD	RATE BASE	EARNINGS @ 10.26%	EARNINGS @ 10%	DIVIDENDS	AMORTIZATION INITIAL FLOTATION COST
0	$ 95.00				
1	99.75	$ 9.75	$ 9.50	$ 5.00	$ 0.25
2	104.74	10.24	9.98	5.25	0.26
3	109.97	10.75	10.47	5.51	0.28
4	115.47	11.29	11.00	5.79	0.29
5	121.25	11.85	11.55	6.08	0.30
6	127.31	12.44	12.12	6.38	0.32
7	133.67	13.07	12.73	6.70	0.34
8	140.36	13.72	13.37	7.04	0.35
9	147.38	14.41	14.04	7.39	0.37
10	154.74	15.13	14.74	7.76	0.39
11	162.48	15.88	15.47	8.14	0.41
12	170.61	16.68	16.25	8.55	0.43
13	179.14	17.51	17.06	8.98	0.45
14	188.09	18.39	17.91	9.43	0.47
15	197.50	19.30	18.81	9.90	0.49
16	207.37	20.27	19.75	10.39	0.52
17	217.74	21.28	20.74	10.91	0.55
18	228.63	22.35	21.77	11.46	0.57
19	240.06	23.46	22.86	12.03	0.60
20	252.06	24.64	24.01	12.63	0.63
…					
50	1,089.40	106.48	103.75	54.61	2.73
…					
100	12,493	1,221	1,190	626	31
…					
150	143,258	14,003	13,644	7,181	359
Present Value@10%				$100	$5

Q. YOUR ILLUSTRATION IS BASED ON AN ASSUMED FIVE PERCENT EQUITY FLOTATION COST. HAVE FINANCIAL ECONOMISTS QUANTIFIED THE AMOUNT OF EQUITY FLOTATION COSTS COMPANIES GENERALLY INCUR WHEN THEY ISSUE NEW SECURITIES IN THE MARKETPLACE?

A. Yes. As described in my direct testimony (Vander Weide Direct at 29), the finance literature provides evidence that equity flotation costs generally are in the range of five percent to eight percent of the proceeds from a new equity issuance.

Q. ARE EQUITY FLOTATION COSTS ALREADY REFLECTED IN THE STOCK PRICES YOU USE IN YOUR DCF STUDIES?

A. No. A flotation cost adjustment is required because a company actually receives an amount to invest that is less than the market price of its stock at the time of the equity issuance. Thus, equity flotation costs are not included in a company's stock or unit price.

Q. IS THE NEED FOR AN EQUITY FLOTATION COST ALLOWANCE ELIMINATED IF A COMPANY'S STOCK/UNIT IS SELLING ABOVE BOOK VALUE?

A. No. Because of equity flotation costs, the amount of money a company can invest in new projects will always be less than the amount of equity it issues in the capital markets. This statement remains true even if the company's stock/unit is selling above book value. For example, in the illustration above, the $100 equity issuance is a measure of the company's market price, and the $95 is a measure of the amount the company has available to invest in new projects. Yet, under the assumptions of my illustration in Table 5, in order to earn the required return of ten percent, the company has to earn 10.26 percent on its investment in the project. The difference between the 10.26 percent required return on the project and the investors' ten percent required return on the investment in the company is the equity flotation cost allowance.

4. COMPARABLE EARNINGS ANALYSIS

Q. WHAT IS THE COMPARABLE EARNINGS METHOD FOR ESTIMATING THE REQUIRED RATE OF RETURN ON EQUITY?

A. As I discuss in my direct testimony, the comparable earnings method estimates the required rate of return on equity by calculating the expected rate of return on book equity for a group of comparable risk companies. (Vander Weide direct at 43)

Q. IS THE COMPARABLE EARNINGS METHOD DESIGNED TO PROVIDE AN ESTIMATE OF A REGULATED COMPANY'S COST OF EQUITY?

A. No. The comparable earnings method is designed to satisfy the United States Supreme Court's fair rate of return standard in the *Hope Natural Gas* case that the "return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks." [*Federal Power Comm'n v. Hope Natural Gas Co*., 320 U.S. 591, 603 (1944).]

Q. DOES DR. WOOLRIDGE AGREE WITH YOUR COMPARABLE EARNINGS APPROACH TO ESTIMATING THE FAIR RATE OF RETURN ON EQUITY FOR DESC?

A. No. Dr. Woolridge argues that the comparable earnings approach does not measure investor return requirements because, as indicated by Professor Morin, it "ignores capital market conditions." (Woolridge at 92)

Q. DR. WOOLRIDGE'S RELIANCE ON A STATEMENT BY PROFESSOR MORIN TO REJECT THE COMPARABLE EARNINGS METHOD IMPLIES THAT PROFESSOR MORIN DISAGREES WITH THE COMPARABLE EARNINGS METHOD. DOES DR. MORIN DISAGREE WITH THE COMPARABLE

EARNINGS METHOD FOR ESTIMATING A REGULATED UTILITY'S FAIR RATE OF RETURN ON EQUITY?

A. No. Dr. Morin validates the use of the comparable earnings method to estimate the fair rate of return on equity for a regulated public utility:

> Although the Comparable Earnings test does not square well with economic theory, the approach is nevertheless meritorious. If the basic purpose of comparable earnings is to set a fair return rather than determine the true economic return, then the argument is academic. If regulators consider a fair return as one that equals the book rates of return earned by comparable-risk firms rather than one that is equal to the cost of capital of such firms, the Comparable Earnings test is relevant. This notion of fairness, rooted in the traditional legalistic interpretation of the Hope language, validates the Comparable Earnings test. (Roger A. Morin, *New Regulatory Finance*, Public Utilities Reports, Inc., 2006, p. 394)

Q. DR. WOOLRIDGE ALSO ARGUES AGAINST THE COMPARABLE EARNINGS APPROACH BECAUSE, ACCORDING TO DR. MORIN, "[O]NLY STOCK MARKET PRICE IS SENSITIVE TO A CHANGE IN INVESTOR REQUIREMENTS." (WOOLRIDGE AT 92) IS DR. WOOLRIDGE'S RECOMMENDATION TO APPLY HIS RECOMMENDED RATE OF RETURN TO HIS RECOMMENDED BOOK VALUE CAPITAL STRUCTURE FOR DESC SENSITIVE TO CHANGES IN INVESTOR RETURN REQUIREMENTS?

A. No.

Q. DOES YOUR COMPARABLE EARNINGS METHOD RELY ON THE AVERAGE HISTORICAL RATE OF RETURN ON EQUITY FOR YOUR PROXY GROUP OF ELECTRIC UTILITIES OR FORECASTED RATES OF RETURN ON BOOK EQUITY FOR THE PROXY GROUP OF ELECTRIC UTILITIES?

A. My comparable earnings method relies on forecasted rates of return on book equity for the proxy group of electric utilities published by Value Line.

Q. DOES THE COMPARABLE EARNINGS METHOD PROVIDE A PRECISE ESTIMATE OF THE REQUIRED RATE OF RETURN ON EQUITY?

A. No. The comparable earnings method only provides an estimate of a company's required rate of return. I have used the comparable earnings method as one of six results, including my DCF, risk premium, and CAPM analyses, to arrive at my estimate of DESC's required rate of return on equity in this proceeding. Dr. Woolridge relies primarily on the result of his DCF analysis. (Woolridge at 7)

5. CAPITAL STRUCTURE ANALYSIS

Q. HOW DO FINANCIAL MARKET PARTICIPANTS MEASURE RISK?

A. Under the assumption that the probability distribution of returns is symmetric, i.e., centered on the mean return, financial market participants generally measure risk by the forward-looking variance of return on investment.

Q. DOES THE FORWARD-LOOKING VARIANCE OF AN INVESTOR'S RETURN ON A STOCK INVESTMENT IN A COMPANY DEPEND ON THE COMPANY'S CAPITAL STRUCTURE?

A. Yes. The forward-looking variance of an investor's return depends on the company's debt to equity ratio, where both debt and equity are measured in terms of market values, not book values.

Q. WHAT IS THE MEANING OF THE TERM, "FINANCIAL RISK"?

A. Economists use the term, "financial risk" to refer to the contribution of the firm's capital structure, that is, its debt to equity ratio, to the forward-looking variance of return on the firm's stock.

Q. DOES FINANCIAL RISK REFLECT THE MARKET VALUES OF DEBT AND EQUITY IN A COMPANY'S CAPITAL STRUCTURE OR THE BOOK VALUES OF DEBT AND EQUITY IN A COMPANY'S CAPITAL STRUCTURE?

A. Financial risk measures the contribution of the company's capital structure to the forward-looking variance of return on the company's stock, and the forward-looking variance of return depends on the market values of debt and equity in the company's capital structure, not the book values. (*See,* for example*,* Richard A. Brealey, Stewart C. Myers, and Franklin Allen, *Principles of Corporate Finance*, 8th ed., McGraw-Hill, 2006, pp. 452 - 456) Thus, financial risk reflects the market values of debt and equity in a company's capital structure, not the book values.

Q. DO FINANCIAL ECONOMISTS AND MARKET PARTICIPANTS AGREE THAT THE VARIANCE OF AN EQUITY INVESTOR'S RETURN ON INVESTMENT DEPENDS ON THE COMPANY'S MARKET VALUE DEBT TO EQUITY RATIO?

A. Yes. Financial economists and market participants agree that the variance of an equity investor's return on investment depends on the company's market value debt to equity ratio. Indeed, the relationship between an equity investor's return on investment and the market value debt to equity ratio is the cornerstone of the Modigliani-Miller theorem, which posits that the investor's required return increases with increasing financial risk as measured by a company's market value debt to equity ratio. The Modigliani-Miller theorem is a universally accepted cornerstone of financial theory.

Q. IS DESC RECOMMENDING THAT ITS WEIGHTED AVERAGE COST OF CAPITAL IN THIS PROCEEDING BE CALCULATED BASED ON THE MARKET VALUES OF DEBT AND EQUITY IN ITS CAPITAL STRUCTURE?

A. No. Consistent with previous regulatory practice, DESC is recommending that its weighted average cost of capital be based on the book values of debt and equity in its capital structure.

Q. IS THE FINANCIAL RISK ASSOCIATED WITH DESC'S RECOMMENDED CAPITAL STRUCTURE MEASURED IN THE SAME WAY AS THE FINANCIAL RISK ASSOCIATED WITH THE CAPITAL STRUCTURES OF YOUR PROXY COMPANIES?

A. No. The financial risk of my proxy companies is reflected in their market value capital structures, while DESC is recommending that a book value capital structure be used for the purpose of setting rates. Thus, the financial risk of my proxy companies is measured by their market value capital structures, while DESC's financial risk is measured by its book value capital structure.

Q. HOW DOES THE AVERAGE MARKET VALUE CAPITAL STRUCTURE OF THE PROXY GROUP OF ELECTRIC UTILITIES YOU USE TO ESTIMATE DESC'S COST OF EQUITY COMPARE TO DESC'S BOOK VALUE CAPITAL STRUCTURE?

A. The average market value capital structure of my proxy electric utilities currently contains approximately 67 percent equity, whereas DESC's revenue requirement is based on a book value capital structure containing only 53.35 percent equity.

Q. HOW DO YOU ADJUST YOUR COST OF EQUITY RESULTS FOR YOUR COMPARABLE COMPANIES TO REFLECT THE DIFFERENCE BETWEEN THE MARKET'S PERCEPTION OF THE LOWER FINANCIAL RISK OF YOUR

PROXY COMPANIES COMPARED TO THE GREATER FINANCIAL RISK REFLECTED IN DESC'S RECOMMENDED CAPITAL STRUCTURE?

A. As described in my direct testimony (see pp. 45 – 48), I adjust the cost of equity results for my comparable companies by equating the after-tax weighted average cost of capital of my proxy companies to the after-tax weighted average cost of capital of DESC. In this procedure, I use market-value capital structure weights for my comparable companies because the cost of capital for these companies is based on market values, and I use book value weights for DESC because the recommended cost of capital for DESC in this proceeding is based on book values.

Q. DOES DR. WOOLRIDGE AGREE WITH YOUR FINANCIAL RISK ADJUSTMENT?

A. No. Dr. Woolridge claims that my financial risk adjustment is unjustified because: (1) a market-to-book ratio above 1.0 indicates that a company is earning more than its cost of equity; (2) there is no change in the company's leverage; (3) financial publications report capital structures based on book values; and (4) no other commissions have accepted using a market value capital structure to calculate the allowed rate of return. (Woolridge at 64 – 65)

Q. DO YOU AGREE THAT A MARKET-TO-BOOK RATIO GREATER THAN 1.0 INDICATES THAT A COMPANY IS EARNING MORE THAN ITS COST OF EQUITY?

A. No. As discussed above, Dr. Woolridge's study updated with November 2020 data demonstrates that many electric and natural gas utilities have estimated ROEs less than 9 percent but also have market-to-book ratios greater than 1.0. These data clearly contradict

Dr. Woolridge's claim that a company's market-to-book ratio is an indicator of whether a company is earning more than its cost of equity.

Q. DOES YOUR FINANCIAL RISK ADJUSTMENT ASSUME A "CHANGE" IN A COMPANY'S LEVERAGE?

A. No. As discussed above, my financial risk adjustment reflects the difference in the financial risk between the capital structures of the proxy companies and the company's ratemaking capital structure. It is unclear what Dr. Woolridge refers to when he notes a "change" in capital structure.

Q. DOES THE OBSERVATION THAT FINANCIAL PUBLICATIONS REPORT CAPITALIZATION ON A BOOK VALUE BASIS UNDERMINE THE VALIDITY OF YOUR FINANCIAL RISK ADJUSTMENT?

A. No. The validity of my financial risk adjustment is based on the widely-recognized observation that the equity investor measures financial risk by the variance of portfolio return; and the variance of an investor's portfolio return depends on the market values of the securities in the portfolio, not on the book values of the securities in the portfolio. The truth of the statement that variance of return depends on market values is recognized both in academia and the marketplace. In addition, investors have no difficulty in calculating market value capital structures from publicly available information.

Q. DR. WOOLRIDGE CLAIMS THAT IN RESPONSE TO ORS REQUEST NO. 5-22, YOU STATE THAT YOU "COULD NOT IDENTIFY ANY PROCEEDING" IN WHICH YOU HAVE TESTIFIED "WHERE THE REGULATORY COMMISSION HAD ADOPTED" YOUR "LEVERAGE ADJUSTMENT." (WOOLRIDGE AT 98 –

99) DOES DR. WOOLRIDGE CORRECTLY CHARACTERIZE YOUR RESPONSE?

A. No. I stated that I do not maintain records of regulatory decisions or a list of all cases in which commissions have accepted my recommendations. However, I noted that I was generally aware that financial adjustments similar to that which I propose have been adopted in Pennsylvania and Canada, and that many states use market value capital structures to determine utility property taxes.

Furthermore, I am also aware that market value capital structures have been used to set allowed rates of return in numerous telecommunications cases in which I have participated since 1996, including the *Virginia Arbitration Proceeding* in which my 12.95 percent overall cost of capital recommendation was accepted, and a Michigan docket in which my 75 percent equity market value capital structure recommendation was accepted. (Memorandum Opinion and Order*, Petition of AT&T Communications of Virginia Inc., Pursuant to Section 252(e)(5) of the Communications Act for Preemption of the Jurisdiction of the Virginia Corporation Commission Regarding Interconnection Disputes With Verizon Virginia Inc*., 18 FCC Rcd 17722 ¶ 94 (2003) (**"***Virginia Arbitration Order***"**) In this proceeding, the Wireline Competition Bureau of the FCC, accepting Verizon's proposal, finds that the appropriate capital structure component of the weighted average cost of capital should be based on the market values of debt and equity, stating, "we give no weight to the portion of AT&T/WorldCom's proposal that is based on incumbent LECs' book value capital structure." *See* Order at ¶¶ 103-104. See also, Michigan Public Service Commission Order, *In the matter, on the Commission's own motion, to review the total element long run incremental costs and the total service long*

run incremental costs for Verizon North Inc., and Contel of the South, Inc., D/B/A Verizon North Systems, to provide telecommunications services, Case No. U-15210, March 18, 2009. "The Commission is not persuaded that Verizon's capital structure should be based on book value. The Commission agrees with the Staff and adopts Verizon's proposed capital structure of 75 percent equity and 25 percent debt." (Order at 17)

Q. DR. WOOLRIDGE CLAIMS THAT INVESTMENT RISK IS MEASURED BY BOND RATINGS." (WOOLRIDGE AT 23) DOES A BOND RATING MEASURE INVESTMENT RISK FROM THE POINT OF VIEW OF AN EQUITY INVESTOR?

A. No. Bond ratings reflect investment risk only from the point of view of debt investors, not the point of view of equity investors.

Q. HOW DOES THE DEBT INVESTOR'S VIEW OF RISK DIFFER FROM THE EQUITY INVESTOR'S VIEW OF RISK?

A. The debt investor's view of risk differs from the equity investor's view of risk in that debt investors are senior to equity investors in the event of financial distress. That is, in the event of financial distress, debt investors are entitled to repayment of their investment before equity investors. Thus, debt investors are primarily concerned with the risk that a company will not be able to repay the interest and principal on its debt, whereas equity investors are primarily concerned with the forward-looking variance of return on the market value of their equity investment.

Q. DOES THE RISK THAT A COMPANY WILL BE UNABLE TO REPAY THE INTEREST AND PRINCIPAL ON ITS DEBT DEPEND ON THE MARKET

VALUES OF THE COMPANY'S DEBT AND EQUITY OR ON THE BOOK VALUES OF THE COMPANY'S DEBT AND EQUITY?

A. Because the interest and principal on a company's debt is based on the book value of a company's debt, the probability of bankruptcy depends on the book value of a company's debt in relation to the book value of a company's equity; that is, the probability of bankruptcy depends on a company's book value capital structure rather than its market value capital structure.

Q. DOES THE FORWARD-LOOKING VARIANCE OF RETURN ON AN EQUITY INVESTMENT DEPEND ON THE MARKET VALUES OR THE BOOK VALUES OF A COMPANY'S DEBT AND EQUITY?

A. The forward-looking variance of return on an equity investment depends on the market values of debt and equity—not the book values of debt and equity—because equity investors can only purchase and sell equity at market values. Thus, from the equity investor's point of view, financial risk depends on a company's market value capital structure, not its book value capital structure.

Q. DOES THE DIFFERENCE BETWEEN MARKET AND BOOK VALUE CAPITAL STRUCTURES HELP TO EXPLAIN YOUR FINANCIAL RISK ADJUSTMENT?

A. Yes. As I discuss in my direct testimony, my financial risk adjustment is required because equity investors look at a company's market value capital structure to determine the financial risk of investing in the company's equity, whereas the rates in this proceeding are based on the company's book value capital structure. Because equity investors' views of financial risk as measured in the marketplace are reflected in my cost of equity estimate, but my cost of equity estimate is applied to a book value capital structure through the

regulatory process, the equity investor is unlikely to have an opportunity to earn the required marketplace return without my financial risk adjustment.

Q. IN SUMMARY, DO YOU AGREE WITH DR. WOOLRIDGES'S CRITICISM OF YOUR FINANCIAL RISK ADJUSTMENT?

A. No. Dr. Woolridge fails to recognize that equity investors measure financial risk by the forward-looking variance of return on their equity investment in the company, and the forward-looking variance of return on an equity investment in a company reflects the company's market value capital structure. Dr. Woolridge's criticism of my financial risk adjustment depends on his incorrect opinion that financial risk reflects book value capitalization ratios rather than market value capitalization ratios. While his opinion may have some relevance from the bond investor's point of view, it is certainly not relevant from the equity investor's point of view. The equity investor's point of view is the only point of view that is relevant for determining the cost of equity.

III. REBUTTAL OF SOUTH CAROLINA DEPARTMENT OF CONSUMER AFFAIRS WITNESS AARON L. ROTHSCHILD

Q. WHAT IS MR. ROTHSCHILD'S RECOMMENDED ALLOWED RATE OF RETURN ON EQUITY FOR DESC?

A. Mr. Rothschild recommends that DESC be allowed to earn a rate of return on equity equal to 8.63 percent. (Rothschild at 3)

Q. HOW DOES MR. ROTHSCHILD ARRIVE AT HIS 8.63 PERCENT RECOMMENDED ALLOWED RATE OF RETURN ON EQUITY FOR DESC?

A. Mr. Rothschild arrives at his recommended 8.63 percent allowed rate of return on equity by estimating DESC's cost of equity, arriving at an average cost of equity equal to

8.76 percent. Mr. Rothschild then lowers the average cost of equity by 13 basis points to arrive at his recommended 8.63 percent allowed rate of return on equity.

Q. HOW DOES MR. ROTHSCHILD ESTIMATE DESC'S COST OF EQUITY?

A. Mr. Rothschild estimates DESC's cost of equity by applying several cost of equity methods to a group of 36 publicly-traded electric utilities. His cost of equity methods include: (1) a constant growth DCF model; (2) a non-constant growth DCF model; and (3) a Capital Asset Pricing Model.

Q. WHAT AREAS OF MR. ROTHSCHILD'S TESTIMONY WILL YOU ADDRESS IN YOUR REBUTTAL TESTIMONY?

A. I will address Mr. Rothschild's constant growth DCF analysis, his non-constant growth DCF analysis, his CAPM analysis, and his comments on my direct testimony.

A. MR. ROTHSCHILD'S DCF ANALYSIS

Q. WHAT DCF MODEL DOES MR. ROTHSCHILD USE TO ESTIMATE DESC'S COST OF EQUITY?

A. Mr. Rothschild uses an annual DCF model of the form, $k = D(1+.5g)/P + g$, to estimate DESC's cost of equity.

Q. WHAT IS THE BASIC ASSUMPTION OF THE ANNUAL DCF MODEL?

A. The annual DCF model is based on the assumption that companies only pay dividends at the end of each year, rather than at the end of each quarter.

Q DOES THE ANNUAL DCF MODEL PROVIDE ACCURATE ESTIMATES OF AN INVESTOR'S REQUIRED OR EXPECTED RATE OF RETURN FROM

INVESTING IN MR. ROTHSCHILD'S PROXY GROUP OF ELECTRIC UTILITIES?

A. No. The annual DCF model of stock valuation produces correct estimates of a firm's cost of equity capital only if the firm pays dividends just once at the end of each year. Because Mr. Rothschild's proxy companies pay dividends quarterly, the annual DCF model produces downwardly biased estimates of the cost of equity. Investors can expect to earn a higher annual effective return on an investment in a firm that pays quarterly dividends than in one that pays the same amount of dollar dividends once at the end of each year. Furthermore, because of the gain associated with the time value of money, investors value a company that pays dividends quarterly more highly than a company that pays dividends annually. Because quarterly dividends are reflected in the stock price component of the DCF model, they must also be reflected in the dividend yield component of the DCF model. Only the quarterly DCF model correctly reflects quarterly dividends in the dividend yield component.

Q. NOTWITHSTANDING YOUR DISAGREEMENT WITH MR. ROTHSCHILD'S DECISION TO USE AN ANNUAL DCF MODEL, DID MR. ROTHSCHILD IMPLEMENT HIS ANNUAL DCF MODEL CORRECTLY?

A. No. The basic assumption of the annual DCF model is that dividends are received annually, and the first dividend is assumed to be received one year from now. Thus, the first dividend must be obtained by taking the current dividend and multiplying by one plus the growth rate, "*g*." Instead, Mr. Rothschild obtained the first dividend by multiplying the current dividend by only one plus one-half the growth rate.

Q. WHAT METHOD DID MR. ROTHSCHILD USE TO ESTIMATE INVESTORS' FUTURE GROWTH EXPECTATIONS, *G*, FOR HIS PROXY COMPANIES?

A. Mr. Rothschild assumes that investors form their growth expectations for the proxy companies by multiplying their average expected retention ratio, *b*, by their average expected rate of return on book equity, *r*, and then adding a term to account for external financing growth. Thus, in Mr. Rothschild's application of the DCF model, $g = br + sv$, where *g* is the growth rate, *b* is the expected percentage of earnings retained in the business, *r* is the expected rate of return on book equity, and *sv* is a term that accounts for growth from the sale of additional shares of stock. The *br* component of the growth rate is called the internal growth component, and the *sv* component of the growth rate is called the external financing component.

Q. WHY DOES MR. ROTHSCHILD RELY ON THE "*BR* + *SV*" METHOD OF ESTIMATING FUTURE GROWTH IN HIS DCF MODEL?

A. Mr. Rothschild argues that the *br* + *sv* method is the only consistent method of estimating future growth in the DCF model.

Q. DO YOU AGREE WITH MR. ROTHSCHILD'S CLAIM THAT HIS *BR* + *SV* METHOD IS THE ONLY CONSISTENT METHOD OF ESTIMATING FUTURE GROWTH IN THE DCF MODEL?

A. No. When applied to a regulated firm, the br + sv method is, in fact, logically inconsistent.

Q. WHY IS MR. ROTHSCHILD'S *BR* + *SV* METHOD LOGICALLY INCONSISTENT?

A. Mr. Rothschild's br + sv method is logically inconsistent because it incorporates information on the firm's expected rate of return on book equity, r, in calculating the firm's

cost of equity through the DCF model. The firm's cost of equity, however, also determines the allowed rate of return on book equity through rate of return regulation. Thus, in the br + sv method, the cost of equity is based on knowledge of the allowed rate of return on equity, and the allowed rate of return on equity is based on knowledge of the cost of equity. The logical circularity, or inconsistency, in applying the br + sv approach to rate-of-return regulated firms cannot be resolved because only one of the two variables can be known before the other is calculated.

Q. CAN YOU ILLUSTRATE THE LOGICAL INCONSISTENCY THAT RESULTS FROM THE APPLICATION OF MR. ROTHSCHILD'S *BR+ SV* APPROACH TO HIS PROXY COMPANIES?

A. Yes. As shown on Exhibit No. __ (ALR 4), page 1, of his direct testimony, Mr. Rothschild assumes that his comparable electric utilities will earn a rate of return on book equity of 10 percent in all future years. Mr. Rothschild uses his 10 percent projected rate of return on book equity assumption to derive his 7.94 percent to 8.00 percent constant growth DCF estimates of his proxy companies' cost of equity. Mr. Rothschild's recommended cost of equity for his proxy companies is 8.63 percent. It is logically inconsistent for Mr. Rothschild to project that his proxy companies will earn 10 percent on book equity while he is recommending a cost of equity of 8.63 percent. If rates were based on a cost of equity equal to 8.63 percent, regulated companies such as Mr. Rothschild's proxy companies would have a difficult time earning a 10 percent rate of return on book equity.

Q. CAN THE LOGICAL INCONSISTENCY OF THE *BR + SV* APPROACH BE ELIMINATED BY CHANGING MR. ROTHSCHILD'S INITIAL ASSUMPTION

ABOUT HIS PROXY COMPANIES' FUTURE EARNED RATE OF RETURN ON BOOK EQUITY FROM 10 PERCENT TO 8.63 PERCENT?

A. No. The basic circularity problem with Mr. Rothschild's br + sv growth method is logical, not numerical. There are several problems with changing the initial earned rate of return on book equity from 10 percent to 8.63 percent. First, in Mr. Rothschild's rate-of-return regulated world, his proxy companies will only have an opportunity to earn 8.63 percent in the future if regulators set these companies' rates to allow them to earn 8.63 percent on book equity. However, under rate of return regulation, regulators set the allowed rate of return equal to the regulated company's cost of equity. Thus, Mr. Rothschild would have to somehow "know" what the regulated company's cost of equity is before he estimates its cost of equity.

Second, if Mr. Rothschild were to assume initially in his *br + sv* growth estimate that his proxy companies would earn 8.63 percent on book equity (all else equal), his constant growth DCF methodology would produce a cost of equity in the range 6.54 percent to 6.61 percent. Thus, Mr. Rothschild would still be assuming that his proxy electric utilities would be able to earn a return more than 200 basis points higher than the DCF model results produced by incorporating an 8.63 percent return assumption.

Q. ON PAGE 35 OF HIS TESTIMONY, MR. ROTHSCHILD CLAIMS THAT THE ARGUMENT REGARDING INCONSISTENCY IGNORES THE DIFFERENCE BETWEEN ACCOUNTING RATES OF RETURN AND MARKET REQUIRED RATES OF RETURN. DO YOU AGREE WITH MR. ROTHSCHILD'S DEFENSE OF HIS *BR + SV* METHOD?

A. No. Mr. Rothschild's error has nothing to do with accounting standards or market returns. It is simply a matter of logic: the cost of equity cannot be based on knowledge of the allowed rate of return on equity, at the same time that the allowed rate of return on equity is based on knowledge of the cost of equity. Only one of these two variables can be known before the other is calculated. However, in the *br + sv* method, a variable that the analyst is attempting to calculate is assumed to be known at the outset of the analysis. Neither variable is determined independently of the other. Thus, the *br + sv* approach cannot be used to calculate the cost of equity for rate-of-return regulated companies.

In addition, Mr. Rothschild fails to recognize that his recommended rate of return on equity becomes an accounting rate of return once it is applied to DESC's book value rate base. Thus, the basic inconsistency in his *br + sv* method is that in his calculation of the allowed rate of return Mr. Rothschild assumes that DESC will be able to earn 10 percent on book equity, when he, in fact, is recommending that DESC only be allowed to earn 8.63 percent on book equity. Mr. Rothschild does not explain how DESC could be expected to earn 10 percent on book equity when it is only allowed to earn 8.63 percent on book equity.

Q. WHERE DOES MR. ROTHSCHILD OBTAIN HIS DATA FOR THE RATE OF RETURN ON BOOK EQUITY VALUES HE USES IN HIS *BR + SV* APPROACH TO ESTIMATING THE GROWTH COMPONENT OF THE DCF COST OF EQUITY?

A. Mr. Rothschild uses rate of return on book equity data from the Value Line Investment Survey and Zacks.

Q. WHAT RATE OF RETURN ON BOOK EQUITY VALUES DOES MR. ROTHSCHILD REPORT FROM THESE DATA SOURCES FOR HIS ELECTRIC UTILITY PROXY COMPANIES?

A. Mr. Rothschild reports five mean values of rates of return on book equity on Exhibit ALR-4, page 1: (1) a 10 percent Value Line expectation; (2) a 9.7 percent expectation derived from Zack's consensus growth rate; (3) a 10.45 percent average earned return on equity in 2019; (4) a 10.16 percent average earned return on equity for 2018; and (5) a 10.15 percent average earned return on equity in 2017.

Q. WHAT RATE OF RETURN DOES MR. ROTHSCHILD USE IN HIS BR + SV CALCULATIONS FOR HIS ELECTRIC COMPANY PROXY GROUP?

A. As noted above, Mr. Rothschild uses 10 percent as his estimate of the expected rate of return on book equity in his *br + sv* calculations for his electric proxy group.

Q. IS MR. ROTHSCHILD'S METHOD FOR ESTIMATING FUTURE RATES OF RETURN ON BOOK EQUITY FOR HIS PROXY ELECTRIC COMPANIES SUBJECTIVE?

A. Yes. Even though four of five of his rate of return data points exceed 10 percent (the lowest value is 9.7 percent), and the mean of his rate of return data points is 10.2 percent, Mr. Rothschild selects 10 percent as his estimate of the expected rate of return on book equity in his *br + sv* calculations for his electric proxy group.

Q. WHAT IS THE DEFINITION OF "RETENTION RATIO"?

A. A firm's retention ratio is defined as the ratio of the firm's retained earnings per share to its earnings per share, where retained earnings is the difference between earnings per share and dividends per share.

Q. WHAT ARE THE FORECASTED RETENTION RATIOS FOR MR. ROTHSCHILD'S PROXY GROUP OF VALUE LINE ELECTRIC UTILITIES?

A. The average and median forecasted retention ratios for the Value Line electric utilities in 2021 are 34.2 percent and 35.6 percent. (See Table 6 below. Data from Rothschild Value Line data reported on his worksheet "MnlData.")

Table 6
Forecasted Retention Ratios
Value Line Electric Utilities

COMPANY	2021 DIVIDEND PER SHARE	2021 EARNINGS PER SHARE	RETENTION RATIO
AMEREN	$2.11	$3.70	43.0%
AMERICAN ELEC. PWR.	$3.00	$4.65	35.5%
AVANGRID, INC.	$1.76	$2.20	20.0%
ALLETE	$2.58	$3.50	26.3%
AVISTA CORP.	$1.68	$2.05	18.0%
BLACK HILLS CORP.	$2.31	$3.70	37.6%
CMS ENERGY CORP.	$1.74	$2.75	36.7%
CENTER POINT EN'RGY	$0.64	$1.45	55.9%
DOMINION ENERGY, INC.	$2.50	$3.65	31.5%
DTE ENERGY CO.	$4.42	$7.15	38.2%
DUKE ENERGY	$3.90	$5.30	26.4%
CON. EDISON	$3.16	$4.50	29.8%
EDISON INTERNAT'L	$2.68	$4.25	36.9%
EVERSOURCE ENERGY	$2.40	$3.75	36.0%
ENTERGY CORP.	$3.86	$5.95	35.1%
EVERGY, INC.	$2.17	$3.10	30.0%
EXELON CORP.	$1.61	$3.00	46.3%
FIRST ENERGY	$1.60	$2.75	41.8%
FORTIS, INC.	$2.08	$2.60	20.0%
HAWAIIAN ELECTRIC	$1.32	$1.80	26.7%
IDACORP, INC.	$2.93	$4.75	38.3%
ALLIANT ENERGY	$1.64	$2.55	35.7%
MGE ENERGY INC.	$1.52	$2.75	44.7%
NEXTERA ENERGY	$6.16	$9.75	36.8%
NORTHWESTERN	$2.50	$3.50	28.6%
OGE ENERGY CORP.	$1.68	$2.25	25.3%
OTTERTAIL CORP.	$1.56	$2.30	32.2%
P.S. ENTERPRISE GP.	$2.04	$3.60	43.3%
PNM RESOURCES	$1.30	$2.25	42.2%
PINNACLE WEST	$3.41	$5.05	32.5%
PORTLAND GENERAL	$1.62	$2.55	36.5%
PPL CORPORATION	$1.67	$2.45	31.8%
SOUTHERN COMPANY	$2.62	$3.25	19.4%
SEMPRA ENERGY	$4.50	$7.75	41.9%
WEC ENERGY GROUP	$2.70	$3.95	31.6%
XCEL ENERGY	$1.82	$2.90	37.2%
MEDIAN			**35.6%**
AVERAGE			**34.2%**

Q. DOES MR. ROTHSCHILD USE THESE RETENTION RATIOS IN HIS APPLICATION OF THE *BR + SV* APPROACH TO ESTIMATING FUTURE GROWTH IN THE DCF MODEL?

A. No. Mr. Rothschild uses retention ratios in the range 30.89 percent to 31.9 percent for his proxy electric group (see Exhibit ALR-4, page 1).

Q. WHAT EXTERNAL GROWTH RATE (*SV*) ESTIMATES DOES MR. ROTHSCHILD USE IN HIS *BR + SV* APPROACH TO ESTIMATING FUTURE GROWTH IN THE DCF MODEL?

A. Mr. Rothschild uses external growth rate values equal to 1.16 and 1.02 (see Exhibit ALR-4, page 1).

Q. WHAT EXTERNAL FINANCING GROWTH RATE VALUE DOES MR. ROTHSCHILD REPORT ON HIS EXHIBIT ALR-4, PAGE 4?

A. Mr. Rothschild reports an external financing value equal to 1.26.

Q. HOW DOES MR. ROTHSCHILD ARRIVE AT THE EXTERNAL FINANCING GROWTH RATE ESTIMATE EQUAL TO 1.26?

A. Examining the data shown on Exhibit ALR-4, page 4, and Mr. Rothschild's workpapers, it is apparent that Mr. Rothschild arrives at the external financing growth rate equal to 1.26 by averaging the values shown in Column 11 of Exhibit ALR-4, page 4, but excluding the three highest values, without excluding either negative values or an additional four values that are very close to zero. Mr. Rothschild's decision to arbitrarily eliminate the three highest values without also eliminating the lowest values, including negative values and values approximately equal to zero, biases his cost of equity estimate downward.

Q. WHAT EXTERNAL FINANCING VALUE WOULD MR. ROTHSCHILD HAVE OBTAINED FROM HIS DATA IF HE HAD AVERAGED THE DATA SHOWN IN COLUMN 11, EXHIBIT ALR-4, PAGE 4?

A. Mr. Rothschild would have obtained an external financing value equal to 1.902. Mr. Rothschild then multiplies the sv value (1.902) by the factor [1 – market-to-book ratio (.81)], which would produce a value equal to 1.54 for the *sv* component of Mr. Rothschild's constant growth DCF calculation.

Q. WHAT COST OF EQUITY ESTIMATE WOULD MR. ROTHSCHILD HAVE OBTAINED FROM HIS CONSTANT GROWTH DCF ANALYSIS IF HE HAD USED AN EXPECTED RETURN ON EQUITY EQUAL TO 10.2 PERCENT, A RETENTION RATIO OF EITHER 34.2 PERCENT OR 35.6 PERCENT, AND AN EXTERNAL FINANCING (*SV*)COMPOMENT EQUAL TO 1.54?

A. If Mr. Rothschild had used these values in his constant growth DCF calculation, he would have obtained estimated costs of equity equal to 9.0 percent and 9.2 percent, estimates that are 100 basis points or more higher than the results he reports on his Exhibit ALR-4, page 1 (see Table 7 below).

Table 7
Recalculation of Rothschild Constant Growth DCF Costs of Equity

Dividend Yield	ALR-4 PAGE 1	3.82%		3.82%
Expected ROE	ALR-4 page 1, [C] average expected returns on equity (10.6, 9.79, 10.26, 9.97, 10.66)	10.2%		10.2%
Retention Ratio	ALR-4 page 2, Rothschild worksheet Value Line EPS "MnlData"	34.2%		35.6%
Reinvestment Growth	Expected ROE x Retention Ratio	3.48%		3.63%
SV	ALR-4 page 4, Average Column 11 excluding negative values, multiplied by (1-1.81)	1.54%		1.54%
Growth	Reinvestment Growth + SV	5.02%		5.17%
Impact of dividend yield adjustment	Dividend Yield + Reinvestment Growth + SV adjustment	0.19%		0.20%
ROE		**9.0%**		**9.2%**

Q. MR. ROTHSCHILD'S CONSTANT GROWTH DCF CALCULATION INCORPORATES RETENTION RATIOS THAT ARE 300 TO 400 BASIS POINTS LOWER THAN VALUE LINE'S AVERAGE 2021 FORECASTED RETENTION RATIOS FOR HIS PROXY COMPANIES. HOW DOES MR. ROTHSCHILD ATTEMPT TO JUSTIFY HIS USE OF LOW RETENTION RATIOS?

A. Mr. Rothschild attempts to justify his use of low retention ratios on the grounds that Value Line and other analysts have failed to recognize that the forecasted retention ratio for a particular company must be consistent with its actual retention ratio reflected in the current dividend. The analysts' failure to recognize this need for consistency, according to Mr. Rothschild, causes them to overestimate forecasted retention ratios, and, hence, growth.

Q. DO YOU AGREE WITH MR. ROTHSCHILD'S CLAIM THAT THE FORECASTED RETENTION RATIO FOR A COMPANY MUST BE CONSISTENT WITH THE COMPANY'S HISTORICAL RETENTION RATIO REFLECTED IN THE CURRENT DIVIDEND?

A. No. The retention ratio reflected in the current dividend depends on the company's earnings in the previous year. Since future earnings are likely to be different from the earnings of the previous year, there is no reason why forecasted retention ratios must be "consistent with" the retention ratio reflected in the firm's current dividend. In addition, Mr. Rothschild fails to recognize that the current retention ratio can be distorted by the inclusion of non-recurring items in the firm's previous year's earnings. Analysts generally eliminate non-recurring items when they forecast future earnings and retention ratios.

Q. DO YOU AGREE WITH MR. ROTHSCHILD'S ASSERTION THAT HIS RETENTION RATIO FORMULA IS THE ONLY CORRECT FORMULA FOR ESTIMATING THE RETENTION RATIO IN THE DCF MODEL?

A. No. Mr. Rothschild has, in fact, used an incorrect formula to calculate his proxy companies' retention ratios. As noted above, the retention ratio is commonly calculated as one minus the dividend payout ratio, where the dividend payout ratio is dividends divided by earnings, or *D/E*. Mr. Rothschild, however, calculated the retention ratio incorrectly, as: one minus the ratio of the dividend yield on book value per share to the rate of return on equity. Thus, Mr. Rothschild calculated the retention ratio not as *(1 - D/E)*, but rather, as *[1 - (D/B÷E/B)]*. This formula would be correct only if Mr. Rothschild had divided both dividends and earnings by the same book value per share, B. However, Mr. Rothschild divided his dividends per share by last year's book value per share, and his earnings per share by some unknown future book value per share. In short, Mr. Rothschild's formula does not correctly measure the retention ratio as one minus the dividend payout ratio.

Q. HAS MR. ROTHSCHILD PROVIDED ANY EVIDENCE THAT INVESTORS USE HIS METHOD FOR CALCULATING A RETENTION RATIO TO ESTIMATE FUTURE DIVIDEND GROWTH?

A. No.

Q. HOW DOES MR. ROTHSCHILD'S NON-CONSTANT GROWTH DCF MODEL DIFFER FROM HIS CONSTANT GROWTH DCF MODEL?

A. Mr. Rothschild's constant growth DCF model assumes that each company's dividends, earnings, and cash flow will grow at the same rate forever. Mr. Rothschild's non-constant growth DCF model assumes that each company's dividends will be equal to Value Line's forecasted dividends per share in each of the next five years; during an intermediate period, dividends will grow at a "compound rate;" and growth after the intermediate period to infinity is equal to the Value Line forecasted book value per share growth. (Rothschild at 41)

Q. WHAT ARE THE BASIC ASSUMPTIONS OF MR. ROTHSCHILD'S NON-CONSTANT GROWTH DCF MODEL?

A. Mr. Rothschild's non-constant growth DCF model is based on the assumptions that the investor: (1) purchases each utility's stock at the closing market price on September 30, 2020; (2) receives the Value Line forecasted dividend per share in 2021, 2022, 2023, and 2024; and (3) sells the stock on September 30, 2024 at a market price calculated by assuming that the market price grows at the same rate as book value.

Q. WHAT AVERAGE NON-CONSTANT GROWTH DCF RESULTS DOES MR. ROTHSCHILD?

A. Mr. Rothschild obtains non-constant growth DCF results of 8.66 percent to 8.87 percent. These results are 72 to 93 basis points higher than the results he obtains from his constant growth DCF model.

Q. YOU NOTE THAT MR. ROTHSCHILD ASSUMES THAT EACH UTILITY'S STOCK PRICE WILL GROW FIRST AT VALUE LINE'S PROJECTED RATE OF GROWTH IN DIVIDENDS PER SHARE AND SUBSEQUENTLY BE SOLD AT PRICES EQUAL TO VALUE LINE'S 2024 PROJECTED BOOK VALUE MULTIPLIED BY THE SEPTEMBER 30, 2020 MARKET-TO-BOOK RATIO. DO YOU AGREE WITH MR. ROTHSCHILD'S ESTIMATE OF THE SEPTEMBER 2024 STOCK PRICE?

A. No. Stock prices depend on dividends and earnings, not book values. Mr. Rothschild should have estimated the 2024 stock prices by multiplying the 2024 earnings per share by the current price/earnings ratio.

Q. WHAT NON-CONSTANT DCF MODEL RESULT WOULD MR. ROTHSCHILD HAVE OBTAINED IF HE HAD ESTIMATED THE SEPTEMBER 30, 2024, STOCK PRICE BY MULTIPLYING THE 2024 FORECASTED EARNINGS BY THE 2020 PRICE/EARNINGS RATIO?

A. Using Mr. Rothschild's dividends, data, and formulas from his workpapers, but estimating the September 30, 2024 stock price based on price/earnings ratios rather than price to book value ratios produces a non-constant DCF cost of equity estimate equal to 10.34 percent, approximately 170 basis points higher than Mr. Rothschild's 8.66 percent DCF estimate (see ALR-4, page 2) (see Table 8 below).

Table 8
Rothschild Non-Constant Growth DCF Model Result
Corrected to Use Terminal Stock Price Value Calculated by
Price to Earnings Ratios Rather than Market-to-Book Ratios

COMPANY	SEP. 30, 2020 PRICE	EPS 2020	P/E 2020	EPS 2024	ESTIMATED SEP. 2024 PRICE	IRR/DCF
AMEREN	$79.08	$3.50	22.59	$4.50	$101.67	9.1%
AMERICAN ELEC. PWR.	$81.73	$4.25	19.23	$5.50	$105.77	10.3%
AVANGRID, INC.	$50.46	$1.95	25.88	$2.50	$64.69	9.7%
ALLETE	$51.74	$3.10	16.69	$4.25	$70.93	13.0%
AVISTA CORP.	$34.12	$1.85	18.44	$2.50	$46.11	12.6%
BLACK HILLS CORP.	$53.49	$3.55	15.07	$4.25	$64.04	9.0%
CMS ENERGY CORP.	$61.41	$2.60	23.62	$3.50	$82.67	10.6%
CENTER POINT EN'RGY	$19.35	$1.30	14.88	$1.60	$23.82	8.8%
DOMINION ENERGY, INC.	$78.93	$3.05	25.88	$4.25	$109.98	11.9%
DTE ENERGY CO.	$115.04	$6.70	17.17	$8.50	$145.95	10.0%
DUKE ENERGY	$88.56	$5.10	17.36	$6.00	$104.19	8.5%
CON. EDISON	$77.80	$3.95	19.70	$5.00	$98.48	10.1%
EDISON INTERNAT'L	$50.84	$4.10	12.40	$5.25	$65.10	11.6%
EVERSOURCE ENERGY	$83.55	$3.60	23.21	$4.50	$104.44	8.6%
ENTERGY CORP.	$98.53	$5.00	19.71	$7.00	$137.94	12.6%
EVERGY, INC.	$50.82	$2.75	18.48	$3.50	$64.68	10.5%
EXELON CORP.	$35.76	$2.70	13.24	$3.50	$46.36	11.2%
FIRST ENERGY	$28.71	$1.95	14.72	$3.25	$47.85	18.8%
FORTIS, INC.	$54.44	$2.50	21.78	$3.00	$65.33	8.6%
HAWAIIAN ELECTRIC	$33.24	$1.65	20.15	$2.00	$40.29	8.8%
IDACORP, INC.	$79.90	$4.55	17.56	$5.50	$96.58	8.6%
ALLIANT ENERGY	$51.65	$2.45	21.08	$3.00	$63.24	8.5%
MGE ENERGY INC.	$62.66	$2.65	23.65	$3.00	$70.94	5.7%
NEXTERA ENERGY	$277.56	$7.65	36.28	$ 12.25	$444.46	14.7%
NORTHWESTERN	$48.64	$3.30	14.74	$3.75	$55.27	8.5%
OGE ENERGY CORP.	$29.62	$2.10	14.11	$2.50	$35.26	10.2%
OTTERTAIL CORP.	$36.17	$2.15	16.82	$2.75	$46.26	10.6%
P.S. ENTERPRISE GP.	$54.91	$3.40	16.15	$4.25	$68.64	9.4%
PNM RESOURCES	$41.33	$1.90	21.75	$2.75	$59.82	12.7%
PINNACLE WEST	$74.55	$4.75	15.69	$5.75	$90.24	9.5%
PORTLAND GENERAL	$35.50	$2.30	15.43	$3.00	$46.30	11.5%
PPL CORPORATION	$27.21	$2.40	11.34	$2.75	$31.18	9.6%
SOUTHERN COMPANY	$54.22	$3.10	17.49	$3.75	$65.59	9.7%
SEMPRA ENERGY	$118.36	$7.20	16.44	$9.50	$156.17	11.0%
WEC ENERGY GROUP	$96.90	$3.75	25.84	$4.75	$122.74	8.9%
XCEL ENERGY	$69.01	$2.75	25.09	$3.50	$87.83	8.9%
Average IRR/DCF Cost of Equity						**10.3%**

B. MR. ROTHSCHILD'S CAPM

Q. THE CAPM REQUIRES ESTIMATES OF THE RISK-FREE RATE, THE COMPANY-SPECIFIC RISK FACTOR, OR BETA, AND EITHER THE REQUIRED RETURN ON AN INVESTMENT IN THE MARKET PORTFOLIO, OR THE RISK PREMIUM ON THE MARKET PORTFOLIO COMPARED TO AN

INVESTMENT IN RISK-FREE GOVERNMENT SECURITIES. HOW DOES MR. ROTHSCHILD ESTIMATE THESE CAPM INPUTS?

A. For the risk-free rate, Mr. Rothschild uses a 0.10 percent spot rate based on three-month Treasury bills at September 30, 2020, and a 1.46 percent spot yield based on long-term Treasury bonds at September 30, 2020. (Rothschild at 48)

For the company-specific risk factor or beta, Mr. Rothschild uses two betas, a "hybrid" beta equal to 0.76 and a "forward" beta equal to 0.62. Mr. Rothschild calculated the hybrid beta equal to 0.76 giving 50 percent weight to his option-implied beta and 50 percent weight to his historical betas calculated from 5-year, 2-year, and 6-month historical data. Mr. Rothschild's forward beta is his 6-month option-implied beta. (Rothschild at 54)

For his estimate of the expected risk premium on the market portfolio, Mr. Rothschild "estimates the option-implied growth rate of the S&P 500" and then adds "the dividend yield and subtract[s] the risk-free rate in order to arrive at the market risk premium." (Rothschild at 63) Mr. Rothschild's two market risk premiums are 12.82 percent short-term and 11.46 percent long-term. (Rothschild at 66)

Q. WHAT CAPM COST OF EQUITY ESTIMATES DOES MR. ROTHSCHILD OBTAIN FROM HIS CAPM ANALYSES?

A. Mr. Rothschild obtains a high CAPM estimate of 10.12 percent (10.12 = 1.47 + 0.76 x 11.46) and a low CAPM estimate of 8.10 percent (8.10 = 0.10 + 0.62 x 12.82). He also reports CAPM estimates equal to 9.79 percent and 8.61 percent. (Rothschild at 66) The average CAPM result of Mr. Rothschild's four studies is 9.2 percent.

Q. DO YOU AGREE WITH MR. ROTHSCHILD'S CAPM ANALYSIS OF DESC'S COST OF EQUITY?

A. No. I disagree with Mr. Rothschild's estimate of the risk-free rate and his failure to acknowledge the substantial evidence that the CAPM tends to underestimate the cost of equity for companies such as his comparable companies with betas less than 1.0.

Q. WHY DO YOU DISAGREE WITH MR. ROTHSCHILD'S 0.10 PERCENT AND 1.47 PERCENT ESTIMATES OF THE RISK-FREE RATE?

A. I disagree with Mr. Rothschild's 0.10 percent and 1.47 percent estimates of the risk-free rate because they are based entirely on the low interest rates the Federal Reserve has engineered currently in order to stimulate the economy during the COVID-19 pandemic.

Q. YOU NOTE THAT MR. ROTHSCHILD USES BETAS EQUAL TO 0.62 AND 0.76. DOES MR. ROTHSCHILD ACKNOWLEDGE THE EVIDENCE THAT THE CAPM TENDS TO UNDERESTIMATE THE COST OF EQUITY FOR COMPANIES, SUCH AS HIS PROXY COMPANIES, THAT HAVE BETAS LESS THAN 1.0?

A. No.

Q. DID YOU PROVIDE EVIDENCE IN YOUR DIRECT TESTIMONY THAT THE CAPM UNDERESTIMATES THE COST OF EQUITY FOR COMPANIES, SUCH AS THE PROXY ELECTRIC UTILITIES, THAT HAVE BETAS LESS THAN 1.0?

A. Yes. I present such evidence in my direct testimony (Vander Weide Direct at 38 – 41 and Exhibit No. __ (JVW-9). My comparison of the earned risk premiums on investments in utility stocks and investments in the S&P 500 over the period 1937 through 2019 indicates that a beta calculated from the historical ratio of the utility risk premium to the S&P 500

risk premium is 0.89. Thus, using substantially lower utility betas equal to 0.62 and 0.76 in his CAPM analysis causes Mr. Rothschild to underestimate the cost of equity for DESC.

C. RESPONSE TO MR. ROTHSCHILD'S COMMENTS ON DR. VANDER WEIDE TESTIMONY

Q. DOES MR. ROTHSCHILD AGREE WITH YOUR 10.4 PERCENT ALLOWED RETURN ON EQUITY RECOMMENDATION IN THIS PROCEEDING?

A. No. Mr. Rothschild claims that my 10.4 percent recommended allowed rate of return on equity should be dismissed because: (1) the growth component of my DCF calculation is derived incorrectly; (2) my risk premium estimate is based on arithmetic mean returns rather than appropriate geometric mean returns; (3) I use interest rate forecasts rather than current interest rates in my risk premium studies; and (4) my financial risk adjustment is inappropriate. (Rothschild at 65 – 68)

Q. HOW DID YOU ESTIMATE THE EXPECTED FUTURE GROWTH COMPONENT OF YOUR DCF STUDIES OF DESC'S REQUIRED RETURN ON EQUITY?

A. As discussed on pages 26 – 27 of my direct testimony, I estimate the expected future growth component of my DCF studies by using "the IBES analysts' estimates of future earnings per share ("EPS") reported by Refinitiv."

Q. WHY DO YOU RELY ON ANALYSTS' EPS GROWTH FORECASTS TO ESTIMATE THE GROWTH COMPONENT OF THE DCF MODEL?

A. As I describe in my direct testimony, I rely on analysts' projections of future EPS growth because there is considerable empirical evidence that investors use analysts' EPS growth forecasts to estimate future earnings growth. The results of studies over many decades,

including my own, demonstrate that analysts' EPS growth forecasts are more highly correlated with stock prices than are other growth forecasts, such as historical growth forecasts and the sustainable growth forecasts used by Mr. Rothschild.

Q. WHY DOES MR. ROTHSCHILD DISAGREE WITH YOUR USE OF CONSENSUS ANALYSTS' GROWTH FORECASTS?

A. Mr. Rothschild claims that analysts' EPS forecasts should not be used to estimate the growth component of the DCF model because "five-year projected growth in earnings per share are not indicative of long-term sustainable growth rates in cash flow." (Rothschild at 75)

Q. HAVE YOU DESCRIBED EVIDENCE CONCERNING THE USE OF ANALYSTS' EPS FORECASTS AS AN ESTIMATE OF INVESTORS' GROWTH EXPECTATIONS IN YOUR DIRECT TESTIMONY AND ABOVE IN YOUR RESPONSE TO DR. WOOLRDIGE?

A. Yes.

Q. DOES MR. ROTHSCHILD PROVIDE ANY EVIDENCE THAT ANALYSTS' EPS GROWTH FORECASTS ARE NOT INDICATIVE OF LONG-RUN FUTURE GROWTH?

A. No.

Q. WHY DOES MR. ROTHSCHILD BELIEVE THAT HIS B X R METHOD FOR ESTIMATING THE GROWTH COMPONENT IN THE DCF MODEL IS A BETTER FORECAST OF LONG-RUN EARNINGS GROWTH THAN ANALYSTS EPS GROWTH FORECASTS?

A. Mr. Rothschild states:

> There are many factors that can cause short-term swings in earnings growth rates, but the long-term sustainable growth is caused by retaining earnings and reinvesting those earnings. Factors that cause short-term swings include anything that causes a company to earn a return on book equity at a rate different from the long-term sustainable rate. (Rothschild at 73)

Q. DO YOU AGREE WITH MR. ROTHSCHILD'S STATEMENT THAT SUSTAINABLE GROWTH IS CAUSED BY RETAINING EARNINGS AND REINVESTING THOSE EARNINGS?

A. No. Sustainable growth depends primarily on: (1) growth in the company's customer base; (2) the size of a company's capital expenditures; and (3) the company's return on investment. Thus, a company can increase its sustainable growth rate by investing in projects with a high rate of return on investment and financing those projects in part with either retained earnings or new equity issuances.

Q. WHAT IS THE PRIMARY DIFFICULTY IN USING THE SUSTAINABLE GROWTH RATE METHOD TO ESTIMATE FUTURE GROWTH AND THE RATE OF RETURN ON EQUITY FOR A REGULATED COMPANY SUCH AS DESC?

A. The primary difficulty is that the sustainable growth method is circular in the sense that one must know the future rate of return on equity in order to calculate the required rate of return on equity, and one must know the required rate of return before one can estimate the earned rate of return.

Q. WHY DID YOU USE ARITHMETIC MEAN RETURNS RATHER THAN GEOMETRIC MEAN RETURNS IN YOUR RISK PREMIUM STUDIES OF DESC'S COST OF EQUITY?

A. As I explain in Exhibit No. __ (JVW-12), I use arithmetic mean returns because, for an investment with an uncertain outcome, the arithmetic mean return is the only return that will make an investment grow to its expected future value. Also see my response to Dr. Woolridge above.

Q. DOES MR. ROTHSCHILD PROVIDE ANY EVIDENCE TO REFUTE YOUR CONCLUSION THAT THE ARITHMETIC MEAN RETURN IS THE ONLY RETURN THAT WILL MAKE AN INVESTMENT GROW TO ITS EXPECTED FUTURE VALUE?

A. No. As noted above, the arithmetic mean return that I used is widely accepted by both the academic community and financial markets as the only return that will make an investment grow to its expected future value. As Brealey, Myers, and Allen state in their chapter titled "Introduction to Risk, Return, and the Opportunity Cost of Capital": "*Moral*: If the cost of capital is estimated from historical returns or risk premiums, use arithmetic averages, not compound annual rates of return." (Brealey, Myers, and Allen, *Principles of Corporate Finance*, 10th ed. McGraw Hill Irwin, p. 151)

Q. WHY DO YOU USE INTEREST RATE FORECASTS RATHER THAN CURRENT INTEREST RATES IN YOUR RISK PREMIUM ANALYSES?

A. I use a forecasted interest rate because the fair rate of return standard requires that DESC have an opportunity to earn its cost of equity during the period when rates are in effect, and the rates approved in this case will not come into effect until later in 2021. As I explain in my direct testimony, I use forecasted yield to maturity on utility bonds rather than a current yield to maturity because: (1) the fair rate of return standard requires that a company have an opportunity to earn its required return on its investment during the forward-looking

period during which rates will be in effect; and (2) current interest rates reflect the unprecedented efforts of the Federal Reserve to preserve liquidity and encourage investment in the face of the economic crisis caused by the global COVID-19 pandemic. Thus, the use of forecasted interest rates is consistent with the fair rate of return standard, whereas the use of current interest rates at this time is not.

Q. WHY DO YOU ADJUST THE COST OF EQUITY RESULTS FOR YOUR PROXY COMPANIES TO REFLECT THE AVERAGE DIFFERENCE BETWEEN THE FINANCIAL RISK OF YOUR PROXY COMPANIES AND THE FINANCIAL RISK REFLECTED IN DESC'S RECOMMENDED BOOK VALUE CAPITAL STRUCTURE?

A. I adjust my cost of equity results because they reflect a lower degree of financial risk than DESC's recommended capital structure. In making this assessment, I recognize that investors measure the financial risk of investing in the equity of my proxy companies based on these companies' market value capital structures, while, consistent with previous regulatory practice, DESC is recommending a book value capital structure for the purpose of setting rates. Because investors demand a higher return for bearing greater risk, an adjustment is required to the cost of equity result for the proxy companies to reflect the higher financial risk associated with DESC's regulatory book value capital structure compared to the lower financial risk reflected in the market value capital structures investors use to assess the financial risk of their equity investments in the marketplace. (See also response to Woolridge above and Vander Weide Direct at 45 – 48)

Q. YOU NOTE THAT INVESTORS MEASURE THE FINANCIAL RISK OF INVESTING IN THE EQUITY OF YOUR PROXY COMPANIES BASED ON

THESE COMPANIES' MARKET VALUE CAPITAL STRUCTURES. WHY DO EQUITY INVESTORS MEASURE THE FINANCIAL RISK OF YOUR PROXY COMPANIES BASED ON THEIR MARKET VALUE CAPITAL STRUCTURES?

A. Equity investors measure financial risk based on market value capital structures because, from the equity investor's point of view, risk is measured by the forward-looking variance of return on investment; and the forward-looking variance of return on investment depends on a company's market value capitalization, not its book value capitalization.

Q. HOW DOES MR. ROTHSCHILD DESCRIBE FINANCIAL RISK?

A. Mr. Rothschild describes a company's financial risk as being "determined by a company's ability to meet its cash flow obligations. The most common and perhaps most important single measure of financial risk is the pretax interest coverage ratio." (See Rothschild at 70)

Q. DOES MR. ROTHSCHILD'S DESCRIPTION OF FINANCIAL RISK REFLECT THE POINT OF VIEW OF EQUITY INVESTORS?

A. No. Mr. Rothschild's definition of financial risk is flawed because it only reflects the point of view of debt investors, who focus primarily on the ability of a company to meet its financial obligation to pay the interest and principal on its debt, not the point of view of equity investors. Whereas debt investors are justifiably concerned with a company's ability to cover the interest and principal payments on its debt, equity investors are primarily concerned with the forward-looking variance of return on their investment. As noted above, the forward-looking variance of return on investment depends on a company's market value capital structure, not its book value capital structure. Indeed, equity investors generally cannot buy a company's stock at book value.

Q. IN SUMMARY, DO YOU AGREE WITH MR. ROTHSCHILD'S CRITICISM OF YOUR FINANCIAL RISK ADJUSTMENT?

A. No. Mr. Rothschild fails to recognize that equity investors measure financial risk by the forward-looking variance of return on their equity investment in the company, and the forward-looking variance of return on an equity investment in a company reflects the company's market value capital structure. Mr. Rothschild's criticism of my financial risk adjustment depends on his incorrect assertion that financial risk is measured by interest coverage ratios rather than market value capitalization ratios. While his assertion may be correct from the bond investor's point of view, it is certainly not correct from the equity investor's point of view; and the equity investor's point of view is the only point of view that is relevant for determining the cost of equity.

IV. REBUTTAL OF DOD/FEA WITNESS DR. ZHEN ZHU

Q. WHAT IS DR. ZHU'S RECOMMENDED ALLOWED RATE OF RETURN ON EQUITY FOR DESC?

A. Dr. Zhu recommends an allowed rate of return on equity for DESC equal to 9.1 percent. (Zhu at 5)

Q. HOW DOES DR. ZHU ARRIVE AT HIS RECOMMENDED 9.1 PERCENT ALLOWED RETURN ON EQUITY FOR DESC?

A. Dr. Zhu arrives at his recommended 9.1 percent allowed rate of return on equity by applying the DCF Model, the CAPM, and the Risk Premium Model to a large proxy group of market-traded electric utilities.

Q. WHAT CAPITAL STRUCTURE AND DEBT COST RATES DOES DR. ZHU RECOMMMEND FOR DESC?

A. Dr. Zhu recommends a capital structure containing 47.44 percent debt and 52.56 percent equity and a debt cost rate equal to DESC's actual 6.46 percent cost of debt. (Zhu at 5-6)

Q. DOES DR. ZHU ALSO RECOMMEND AN OVERALL RATE OF RETURN FOR DESC?

A. Yes. Dr. Zhu recommends an overall rate of return for DESC equal to 7.85 percent (Zhu at 6), 63 basis points lower than my overall recommended rate of return equal to 8.48 percent.

Q. WHAT AREAS OF DR. ZHU'S TESTIMONY WILL YOU ADDRESS?

A. I will address Dr. Zhu's: (1) DCF analysis; (2) CAPM analysis; (3) Risk Premium analysis; (4) capital structure analysis; and (5) comments on my studies of DESC's cost of equity.

Q. DOES DR. ZHU IN HIS ANALYSIS ACCEPT THE COMPANY'S ACTUAL WEIGHTED AVERAGE COST OF DEBT OF 6.46 PERCENT AS REFLECTED ON THE COMPANY'S BOOKS?

A. Yes, he does, and, consistent with my own opinion and analysis, Dr. Zhu correctly uses in his analysis DESC's actual 6.46 percent cost of debt for ratemaking purposes. Company Witness Griffin explains in detail in her rebuttal testimony the process used for retiring debt on the Company's books following the merger on January 1, 2019. I view the process as being fair and driven by market conditions that existed at the time, and I concur with Dr. Zhu in the use of the Company's actual cost of debt for ratemaking purposes in this case.

A. DR. ZHU'S DCF ANALYSIS

Q. WHAT DCF MODEL DOES DR. ZHU USE TO ESTIMATE DESC'S COST OF EQUITY?

A. Dr. Zhu uses an annual DCF model to estimate DESC's cost of equity of the form $k = D(1+g)/P + g$, where k is the cost of equity, D is the expected next period dividend, P equals stock price, and g is the expected growth in dividends and earnings per share.

Q. DO YOU AGREE WITH DR. ZHU'S USE OF AN ANNUAL DCF MODEL TO ESTIMATE DESC'S COST OF EQUITY?

A. No. As discussed in my rebuttal of Dr. Woolridge and Mr. Rothschild, the DCF model is based on the assumption that a company's stock price reflects the present value of the dividends investors expect to receive from their ownership of the stock. Because the companies in Dr. Zhu's analysis all pay dividends quarterly, these companies' stock prices reflect the present value of a quarterly stream of dividends. Hence, the quarterly DCF model is the only DCF model that is consistent with the basic assumption that stock prices are equal to the expected present value of future dividends.

Q. HOW DID DR. ZHU ESTIMATE THE DIVIDEND YIELD COMPONENT OF HIS ANNUAL DCF MODEL?

A. Dr. Zhu estimated the dividend yield component by calculating the average dividend yield of his proxy companies for each month of the six-month period April 1, 2020 through September 30, 2020, and multiplying the average dividend yield for this period by the factor (1 + expected growth rate).

Q. DOES DR. ZHU PRESENT MORE THAN ONE DCF ANALYSIS FOR THE COMMISSION TO CONSIDER?

A. Yes. Dr. Zhu presents two DCF analyses: (1) a constant growth one-step DCF analysis based on analysts' growth rates; (2) a two-step DCF analysis where the growth component is based on an average of analysts' growth rates and an estimate of long-term growth calculated by weighting his EPS growth rate by 0.8 and Gross Domestic Product ("GDP" growth rate by 0.2. (Zhu at 33—35)

Q. WHAT DCF RESULTS DOES DR. ZHU OBTAIN FROM HIS CONSTANT GROWTH DCF ANALYSIS BASED ON ANALYSTS' GROWTH RATES?

A. Dr. Zhu obtains a median result equal to 8.74 percent, an average DCF result equal to 8.65 percent, and a midpoint result equal to 9.12 percent for his proxy group based on his application of his constant growth DCF analysis. (Zhu at 36)

Q. WHAT DCF RESULTS DID DR. ZHU OBTAIN FROM HIS APPLICATION OF A TWO-STEP DCF MODEL TO HIS PROXY GROUP OF ELECTRIC UTILITIES?

A. Dr. Zhu obtains a median result equal to 8.4 percent, an average DCF result equal to 8.49 percent, and a midpoint result equal to 8.89 percent for his proxy group based on his application of his two-step DCF analysis. (Zhu at 36)

Q. DO YOU AGREE WITH DR. ZHU'S USE OF ANALYSTS' GROWTH FORECASTS AS A PROXY FOR INVESTORS' GROWTH EXPECTATIONS IN HIS CONSTANT GROWTH DCF ANALYSIS?

A. Yes. Dr. Zhu's use of analysts' growth forecasts is consistent with the results of studies, including my own, that demonstrate that analysts' growth forecasts are more highly correlated with stock prices than are other growth forecasts, such as historical growth forecasts and sustainable growth forecasts.

Q. WHY DOES DR. ZHU ALSO PERFORM A TWO-STEP DCF ANALYSIS?

A. Dr. Zhu states that he also uses a two-step DCF analysis because he considers that the IBES growth forecast may not represent a reasonable estimate of long run growth. As discussed above, Dr. Zhu's two-step analysis uses as the estimate of growth in the DCF model a value based on the IBES growth forecast weighted at 0.8 and a forecast of long-term GDP growth weighted at 0.2. (Zhu at 33-34).

Q. WHAT SOURCES DOES DR. ZHU USE FOR HIS LONG-TERM GDP GROWTH RATE FORECAST?

A. Dr. Zhu uses two sources of the expected long-term GDP growth, including data published by the Energy Information Administration, Annual Energy Outlook (AEO) 2020 and the Social Security Administration, 2020 OASDI Trustees Report. (Zhu at 34) Dr. Zhu arrives at a long-term GDP growth forecast equal to 4.09 percent. (Zhu at 35)

Q. DO YOU AGREE WITH DR. ZHU'S REPORTED 4.09 PERCENT GDP GROWTH FORECAST?

A. No. After reviewing Dr. Zhu's workpapers and sources, I note that he should have calculated a long-term GDP growth rate forecast equal to 4.17 percent, a discrepancy which is due to using EIA data for 2024 rather than 2023.

Q. DOES DR. ZHU INCLUDE AN ALLOWANCE FOR FLOTATION COSTS IN HIS DCF ANALYSIS?

A. No.

Q. DO YOU AGREE WITH DR. ZHU'S FAILURE TO INCLUDE FLOTATION COSTS IN HIS DCF ANALYSIS?

A. No. As discussed in my direct testimony, flotation costs are a cost of issuing securities that must be reflected in a cost of equity analysis for investors to earn a return that is

commensurate with returns on other investments of the same risk. Dr. Zhu's DCF results would increase by approximately 20 basis points if he had appropriately included a flotation cost allowance.

B. DR. ZHU'S CAPM

Q. WHAT IS THE CAPM?

A. The CAPM is an equilibrium model of the security markets in which the expected or required return on a given security is equal to the risk-free rate of interest, plus the company equity "beta," times the market risk premium:

Cost of equity = Risk-free rate + Equity beta x Market risk premium

The risk-free rate in this equation is the expected rate of return on a risk-free government security, the equity beta is a measure of the company's risk relative to the market as a whole, and the market risk premium is the premium investors require to invest in the market basket of all securities compared to the risk-free security.

Q. THE CAPM REQUIRES ESTIMATES OF THE RISK-FREE RATE, THE COMPANY-SPECIFIC RISK FACTOR, OR BETA, AND EITHER THE REQUIRED RETURN ON AN INVESTMENT IN THE MARKET PORTFOLIO, OR THE RISK PREMIUM ON THE MARKET PORTFOLIO COMPARED TO AN INVESTMENT IN RISK-FREE GOVERNMENT SECURITIES. HOW DOES DR. ZHU ESTIMATE THESE CAPM INPUTS?

A. For the risk-free rate, Dr. Zhu used the 1.37 percent average yield on 30-year Treasury bonds over the period April through September 2020. For the company-specific risk factor or beta, Dr. Zhu uses the average 0.87 Value Line beta for his proxy companies. For his

estimate of the expected risk premium on the market portfolio, Dr. Zhu uses a market risk premium estimate equal to 9.54 percent. (Zhu at 40)

Q. WHAT COST OF EQUITY ESTIMATE DOES DR. ZHU OBTAIN FOR DESC BASED ON HIS APPLICATION OF THE CAPM?

A. Dr. Zhu obtains an average estimate equal to 9.72 percent based on his application of the CAPM. (Zhu at 40)

Q. HOW DOES DR. ZHU'S 9.72 PERCENT AVERAGE CAPM ESTIMATE OF THE COST OF EQUITY COMPARE TO YOUR CAPM ESTIMATES OF DESC'S COST OF EQUITY?

A. Dr. Zhu's 9.72 percent CAPM cost of equity estimate is within, but at the lower end of the 9.4 percent to 10.7 percent range of CAPM results that I report on Table 1, page 45 of my direct testimony, and also at the lower end of my updated CAPM results in the range 9.5 percent to 10.8 percent.

Q. DID DR. ZHU INCLUDE A FLOTATION COST ALLOWANCE IN HIS CAPM ESTIMATE OF DESC'S COST OF EQUITY?

A. No. If Dr. Zhu had reasonably added a flotation cost allowance of 20 basis points to his CAPM result, he would have obtained a CAPM cost of equity estimate for DESC equal to 9.92 percent, which would be closer to the midpoint of the range reported from my analysis.

C. DR. ZHU'S RISK PREMIUM MODEL

Q. PLEASE DESCRIBE THE RISK PREMIUM METHOD FOR ESTIMATING THE COST OF EQUITY.

A. As described in my direct testimony, the risk premium method is based on the principle that investors expect to earn a return on an equity investment that reflects a "premium" over and above the interest rate they expect to earn on an investment in bonds. This equity risk premium compensates equity investors for the additional risk they bear in making equity investments versus bond investments.

Q. HOW DOES DR. ZHU USE THE RISK PREMIUM APPROACH TO ESTIMATE DESC'S REQUIRED RETURN ON EQUITY IN THIS PROCEEDING?

A. Dr. Zhu implements the risk premium approach in several steps. First, he gathers data on authorized returns on equity in electric utility decisions over the period beginning January 1980 through the present time and historical yields on 30-year Treasury bonds. For the interest rate component of the risk premium approach, Dr. Zhu uses the average of the trailing nine months of daily yields on 30-year Treasury bonds. For the risk premium component, Dr. Zhu subtracts the average daily yield on 30-year Treasury bonds over the previous nine months from the value of the authorized return on equity in each case. Third, Dr. Zhu performs a regression analysis of the relationship between the implied risk premium in each case compared to the nine-month average interest rate to estimate the sensitivity of the implied allowed risk premium to changes in interest rates. Fourth, Dr. Zhu uses the results of his regression analysis to estimate the required risk premium on utility stocks in today's interest rate environment. (Zhu at 41–42)

Q. WHAT ESTIMATED RISK PREMIUM DOES DR. ZHU OBTAIN FROM HIS ANALYSIS OF ALLOWED RISK PREMIUMS AND INTEREST RATES SINCE 1980?

A. From his regression analysis, Dr. Zhu obtains an estimated required risk premium equal to 7.29 percent. (Zhu at 43).

Q. WHAT COST OF EQUITY ESTIMATE DOES DR. ZHU OBTAIN FROM HIS RISK PREMIUM ANALYSIS?

A. Using a 1.44 percent 30-year Treasury bond yield as his estimate of the risk-free interest rate, Dr. Zhu obtains a risk premium estimate of the cost of equity equal to 8.73 percent (8.73 = 1.44 + 7.29). (Zhu at 43)

Q. DO YOU AGREE WITH DR. ZHU'S 8.73 PERCENT RISK PREMIUM ESTIMATE OF DESC'S COST OF EQUITY?

A. No. Dr. Zhu's risk premium analysis is distorted by the fact that each allowed return on equity decision in his analysis has an equal weight, but there are far more cases in the early 1980s, when interest rates were extraordinarily high and risk premiums correspondingly low, than there have been in the years since that time. For example, based on the data used in Dr. Zhu's regression analysis (Exhibit __ (ZZ-8), there were 398 cases in the five years 1980 through 1984, whereas in the five-year period 2016 through 2020, there were only 71 decisions. Thus, the first five years of data, 1980 through 1984, include 39 percent of his total sample, and hence have a disproportionate impact on Dr. Zhu's risk premium estimate of the cost of equity.

In addition, it appears that Dr. Zhu failed to include all relevant data in his regression analysis. Dr. Zhu's regression is based on a set of 1,033 decisions, but his workpapers show that there are 1,449 available return on equity decisions for vertically-integrated utilities during the period 1980 through 2020.

Q. DR. ZHU EXPLAINS THAT HE HAS INCLUDED ALL DECISIONS FOR VERTICALLY-INTEGRATED ELECTRIC UTILITIES, INCLUDING BOTH LITIGATED DECISIONS AND SETTLED DECISIONS. (ZHU AT 43) HAVE YOU PERFORMED A REGRESSION ANALYSIS USING ALL THE ROE DECISIONS FOR VERTICALLY-INTEGRATED ELECTRIC UTILITIES FROM 1980 THROUGH 2020?

A. Yes. However, as I note above, there are significantly more decisions in the earlier years of this period compared to the number of decisions in later years. For example, in the updated database that includes all ROE decisions for vertically-integrated utilities, both litigated and settled, there are 519 decisions in the first five years through 1984, (30 percent of the 1,449 decisions) but only113 in the most recent five years. In my regression study I use all available data from Dr. Zhu's database, and I regress the risk premium obtained by subtracting the *annual average* yield on 30-year Treasury bonds from the *annual average* allowed ROE.

Q. WHAT RISK PREMIUM AND RISK PREMIUM COST OF EQUITY DO YOU OBTAIN FROM YOUR ANALYSIS OF DR. ZHU'S CORRECTED REGRESSION DATABASE?

A. Using the most recent 1.45 percent three-month average yield on 30-year Treasury bonds as the interest rate, the regression produces a risk premium equal to 9.16 percent. Adding the 9.16 percent risk premium to the 1.45 percent average 30-year Treasury bond yield produces a risk premium cost of equity equal to 10.61 percent, as shown in the following table.

Table 9
Corrected Zhu Regression Analysis

Bond Yield =	1.45
Intercept (a)	10.27
Tbond Coefficient	-0.76
Bond coefficient x Bond yield =	-1.11
Risk Premium	9.16
Bond yield =	1.45
Risk Premium Cost of Equity =	**10.61**

Q. WHAT CONCLUSIONS DO YOU DRAW REGARDING DR. ZHU'S RISK PREMIUM COST OF EQUITY ESTIMATE?

A. I conclude that Dr. Zhu's 8.73 percent risk premium cost of equity estimate significantly understates the cost of equity. I further conclude that a reasonable risk premium analysis based on allowed electric utility returns on equity and interest rates over the period 1980 – 2020 produces a risk premium cost of equity estimate equal to 10.6 percent.

Q. YOU DISCUSS ABOVE DR. ZHU'S DCF, CAPM, AND RISK PREMIUM STUDIES. WHAT IS YOUR CONCLUSION REGARDING DR. ZHU'S RECOMMENDED 9.1 PERCENT ALLOWED RATE OF RETURN ON EQUITY FOR DESC?

A. I conclude that Dr. Zhu's recommendation is unreasonably low and should have been higher. In fact, if Dr. Zhu had appropriately included an adjustment for the difference between the market value capital structure of his proxy companies and DESC's regulatory book value capital structure, his recommended allowed rate of return on equity would be higher.

D. RESPONSE TO DR. ZHU'S COMMENTS ON DR. VANDER WEIDE TESTIMONY

Q. DOES DR. ZHU AGREE WITH YOUR COST OF EQUITY ESTIMATE FOR DESC?

A. No. Dr. Zhu disagrees with my: (1) use of interest rate forecasts in my risk premium and CAPM analyses; (Zhu at 48 – 54) (2) dividend yield and growth rate estimates in my DCF analysis (Zhu at 58); (3) inclusion of flotation costs (Zhu at 58–60); (4) comparable earnings analysis (Zhu at 60 – 61); and (5) financial risk adjustment (at 61 – 65)

1. INTEREST RATE FORECASTS

Q. WHY DOES DR. ZHU DISAGREE WITH YOUR USE OF INTEREST RATE FORECASTS IN YOUR RISK PREMIUM AND CAPM STUDIES?

A. Dr. Zhu disagrees with my use of forecast interest rates in my risk premium and CAPM studies because he believes current interest rates are the best forecast of future interest rates. (Zhu at 50)

Q. WHY DO YOU USE A FORECASTED RATHER THAN A CURRENT INTEREST RATE IN YOUR RISK PREMIUM ANALYSES?

A. I use a forecasted interest rate because: (1) the fair rate of return standard requires that DESC have an opportunity to earn its cost of equity during the period when rates are in effect and the rates approved in this case will not come into effect until 2021; and (2) current interest rates are unreasonable estimates of future interest rates because they are highly distorted by the economic impacts of the COVID-19 pandemic and the Federal Reserve's extraordinary efforts to stimulate the economy.

Q. DR. ZHU ALSO CRITICIZES YOUR SPECIFIC USE OF EIA INTEREST RATE FORECASTS TO DEVELOP THE INTEREST RATE FORECASTS YOU USE IN YOUR STUDIES, ASSERTING: "DESPITE AMPLE EVIDENCE THAT THE EIA FORECAST CANNOT BE TRUSTED, DR. VANDER WEIDE STILL USED THE EIA FORECAST IN PROJECTING THE REQUIRED RETURN ON EQUITY BECAUSE THOSE INTEREST RATE FORECASTS WOULD GENERATE A HIGHER ROE FOR THE COMPANY, NOT BECAUSE IT WILL GENERATE THE FAIR AND JUST ROE." (ZHU AT 54) DID YOU USE THE EIA FORECAST INI ORDER TO "GENERATE A HIGHER ROE FOR THE COMPANY, AND NOT TO "GENERATE THE FAIR AND JUST ROE"?

A. No. I use the EIA interest rate forecasts (along with Value Line interest rate forecasts) because the EIA interest rate forecasts are widely and freely available to all investors. In addition, the EIA interest rate forecasts also specifically include a forecast interest rate for utility bond yields.

Q. DOES DR. ZHU ATTEMPT TO ESTIMATE THE COST OF EQUITY YOU WOULD HAVE OBTAINED FROM YOUR RISK PREMIUM COST OF EQUITY STUDIES IF YOU HAD USED ONLY VALUE LINE FORECASTED YIELDS AND ELIMINATED THE USE OF THE EIA INTEREST RATE FORECASTS?

A. Yes. Dr. Zhu recalculates my studies using current interest rates or interest rates based on Value Line forecast interest rates and shows an average risk premium cost of equity result equal to 8.73 percent. (Zhu at 56).

Q. DID DR. ZHU CORRECTLY IMPLEMENT YOUR RISK PREMIUM STUDIES USING THE VALUE LINE FORECAST INTEREST RATE?

A. No. There are several errors in Dr. Zhu's analysis. First, Dr. Zhu did not correctly calculate the ex ante risk premium cost of equity because he used a different interest rate in the risk premium equation without calculating the risk premium which results from using a different interest rate. Second, Dr. Zhu's average risk premium cost of equity result, 8.73 percent, depends on the average of two ex post risk premium results, whereas I use one ex post risk premium cost of equity result based on using the average of two historical ex post risk premium values.

Q. PLEASE DESCRIBE THE ERROR IN DR. ZHU'S RECALCULATION OF YOUR EX ANTE RISK PREMIUM COST OF EQUITY.

A. Dr. Zhu's fails to take into account that the risk premium changes when there are changes in the interest rate. When interest rates are relatively high, the measured risk premium is relatively low because investors are expecting that the value of their debt investment will increase when interest rates go lower. Similarly, when interest rates are low, investors demand a higher risk premium because the value of their debt investments will decline when interest rates increase. Thus, changes in the relative risk of equity and debt investments are implicitly included in my ex ante risk premium analysis. However, Dr. Zhu mistakenly adds an estimated risk premium of 5.64 percent that applies only to a bond yield equal to 4.4 percent to lower a bond yield equal to 3.95 percent. Thus, Dr. Zhu should have used my regression coefficients to obtain an equity risk premium estimate that corresponds to Dr. Zhu's assumed 3.95 percent bond yield.

Q. WHAT IS THE EFFECT OF DR. ZHU'S ERROR REGARDING THE EX ANTE RISK PREMIUM COST OF EQUITY?

A. Had Dr. Zhu correctly used the regression equation described in my testimony to identify the required equity risk premium corresponding to a bond yields equal to 3.95 percent, he would have found that his estimate of the risk premium cost of equity is equal to 9.87 percent, not the 9.59 percent Dr. Zhu mistakenly reports (See **Table 10** below.)

Table 10
Ex Ante Risk Premium Cost of Equity Corresponding to Revised Interest Rate

1	Constant Coefficient	8.21%
2	Bond coefficient	-58.06%
3	Forecast bond yield =	3.95%
4	Bond coefficient x Bond yield =	-2.29%
5	Ex Ante Risk Premium	5.92%
6	Forecast bond yield =	3.95%
7	Ex Ante Risk Premium Cost of Equity =	9.87%

Q. DOES DR. ZHU ALSO RECALCULATE EX POST RISK PREMIUM RESULTS USING ONLY THE VALUE LINE INTEREST RATE FORECAST?

A. Yes. However, Dr. Zhu fails to acknowledge that I use only one ex post risk premium cost of equity, whereas he provides two ex post risk premium costs of equity to produce the value he reports in his Table 6.

Q. WHAT AVERAGE RISK PREMIUM COST OF EQUITY RESULTS WOULD DR. ZHU HAVE OBTAINED USING THE VALUE LINE INTEREST RATE FOREAST IF HE HAD USED THE METHODS YOU PRESENTED IN YOUR DIRECT TESTIMONY?

A. Dr. Zhu would have calculated an average value equal to 9.2 percent, approximately 50 basis points higher than the 8.73 percent value he presents.

Q. DOES YOUR COST OF EQUITY RECOMMENDATION FOR DESC DEPEND ONLY ON RISK PREMIUM ANALYSES?

A. No. My cost of equity recommendation depends on the results of six cost of equity model results.

2. EPS GROWTH FORECASTS IN DCF ANALYSIS

Q. WHY DOES DR. ZHU DISAGREE WITH YOUR USE OF THE IBES EPS GROWTH FORECASTS IN YOUR DCF ANALYSIS?

A. Dr. Zhu criticizes my use of the IBES growth forecasts because he believes that the IBES growth rates that I use in my DCF model are short-term growth forecasts, and the DCF model requires the use of long-term growth forecasts. In his opinion, investors "look at the sustainable long-term growth rates longer than the typical three- to five-year periods that analysts use." (Zhu at 58)

Q. DO YOU AGREE WITH DR. ZHU'S STATEMENT THAT INVESTORS LOOK AT SUSTAINABLE LONG-TERM GROWTH RATES RATHER THAN ANALYSTS' GROWTH FORECASTS TO ESTIMATE LONG-RUN GROWTH IN EARNINGS AND DIVIDENDS PER SHARE?

A. No. As I discuss above, my use of analysts' growth forecasts is consistent with the results of studies, including my own, that demonstrate that analysts' growth forecasts are more highly correlated with stock prices than are other growth forecasts, such as historical growth forecasts and sustainable growth forecasts. Dr. Zhu's decision to use a growth rate calculated by weighting IBES growth rates at 0.8 and a GDP growth forecast by 0.2 may

not be shared or known by other investors who are making stock buy and sell decisions, whereas the IBES growth forecasts are widely available.

3. FLOTATION COSTS

Q. WHY DOES DR. ZHU DISAGREE WITH YOUR INCLUSION OF FLOTATION COSTS IN YOUR COST OF EQUITY ANALYSES?

A. Dr. Zhu argues that allowing the company to be compensated in the cost of equity for flotation costs would allow investors to be "compensated twice" because investors will be aware of transaction costs and will already have "considered this information when pricing the stocks they are purchasing." (Zhu at 59)

Q. ARE EQUITY FLOTATION COSTS ALREADY REFLECTED IN THE STOCK PRICES YOU USE IN YOUR DCF STUDIES?

A. No. A flotation cost adjustment is required because a company actually receives an amount to invest that is less than the market price of its stock at the time of the equity issuance. Thus, equity flotation costs are not included in a company's stock or unit price.

Q. WHAT IS THE ECONOMIC BASIS OF YOUR RECOMMENDED FLOTATION COST ALLOWANCE?

A. As I discuss above in my rebuttal of Dr. Woolridge, my recommended flotation cost allowance is based on the fundamental economic and regulatory principles that: (1) a company should only invest in a new project if it can earn a return on its investment that is equal to or greater than its cost of capital; and (2) the time pattern of expense recovery should match the time pattern of benefits resulting from the expense. Because equity flotation costs are a legitimate expense of raising capital, a company has no incentive to

invest in new capital projects if equity flotation costs are not included in the cost of capital estimate. In addition, because the proceeds of an equity issuance are invested in assets that provide benefits over a long time period, the costs of an equity issuance should be recovered over a long period of time.

4. COMPARABLE EARNINGS ANALYSIS

Q. WHY DOES DR. ZHU OBJECT TO YOUR COMPARABLE EARNINGS ANALYSIS?

A. Dr. Zhu criticizes my comparable earnings analysis as being "problematic as investors require a fair return on market value of equity, not book value, because investors cannot buy stocks at book value." (Zhu at 60)

Q. IS THE COMPARABLE EARNINGS METHOD DESIGNED TO PROVIDE AN ESTIMATE OF A REGULATED COMPANY'S COST OF EQUITY?

A. No. As I discuss above in my rebuttal of Dr. Woolridge, the comparable earnings method is designed to satisfy the United States Supreme Court's fair rate of return standard in the *Hope Natural Gas* case that the "return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks." [*Federal Power Comm'n v. Hope Natural Gas Co*., 320 U.S. 591, 603 (1944).] Thus, I use the comparable earnings method to estimate the fair rate of return on equity for a regulated public utility, DESC.

5. FINANCIAL RISK ADJUSTMENT

Q. WHY DO YOU ADJUST THE COST OF EQUITY RESULTS FOR YOUR PROXY COMPANIES TO REFLECT THE AVERAGE DIFFERENCE BETWEEN THE FINANCIAL RISK OF YOUR PROXY COMPANIES AND THE FINANCIAL RISK REFLECTED IN DESC'S RECOMMENDED CAPITAL STRUCTURE?

A. As I explained in my direct testimony, I adjust my cost of equity results because they reflect a lower degree of financial risk than DESC's recommended book value capital structure. In making this assessment, I recognize that investors measure the financial risk of investing in the equity of my proxy companies based on these companies' market value capital structures, while DESC is recommending a book value capital structure to set rates. Because investors demand a higher return for bearing greater risk, and the average book value capital structure of Dr. Zhu's proxy companies reflects a high degree of financial risk than the market value capital structure of the proxy group, an adjustment is required to the cost of equity result for the proxy companies.

Q. YOU NOTE THAT INVESTORS MEASURE THE FINANCIAL RISK OF INVESTING IN THE EQUITY OF YOUR PROXY COMPANIES BASED ON THESE COMPANIES' MARKET VALUE CAPITAL STRUCTURES. WHY DO EQUITY INVESTORS MEASURE THE FINANCIAL RISK OF THE PROXY COMPANIES BASED ON THEIR MARKET VALUE CAPITAL STRUCTURES?

A. Equity investors measure financial risk based on market value capital structures because, from the equity investor's point of view, risk is measured by the forward-looking variance of return on investment; and the variance of return on investment depends on a company's market value capitalization, not its book value capitalization.

Q. WHAT IS DR. ZHU'S CRITICISM OF YOUR FINANCIAL RISK ADJUSTMENT?

A. Dr. Zhu states that I have calculated the market value capital structure of the electric utilities incorrectly because I have used the book value of debt rather than calculating a market value of debt for the Value Line electric utilities. (Zhu at 62 – 63)

Q. DO YOU AGREE WITH DR. ZHU'S CRITICISM THAT YOU SHOULD HAVE CALCULATED THE MARKET VALUE CAPITAL STRUCTURE OF THE VALUE LINE ELECTRIC UTILITIES USING MARKET VALUES OF DEBT RATHER THAN THE BOOK VALUES OF THE VALUE LINE ELECTRIC UTILITIES' DEBT?

A. No. When estimating the market value of debt for industries or sectors, it is a common convention to use the book value of debt as a proxy for the market value of debt. For example, Brealey, Myers, and Allen state, "For healthy firms the market value of debt is usually not too far from book value, so many managers and analysts use book value for D[ebt] in the weighted-average cost of capital formula. (Brealey, Myers, and Allen, *Principles of Corporate Finance*, 10th ed. McGraw Hill Irwin, p. 483) Damodaran explains that he calculates industry sector market value debt ratios "by dividing the cumulated value of debt by the cumulated value of debt plus the cumulated market value of equity for the entire sector. We assume that the book value of debt is roughly equal to the market value of debt." (See–http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/variable.htm) My analysis of average market value equity ratios based on using the book value of debt as a proxy for market value is entirely reasonable.

Q. ARE THE VALUE LINE ELECTRIC UTILITIES IN YOUR MARKET VALUE CAPITAL STRUCTURE ANALYSIS "HEALTHY FIRMS"?

A. Yes.

Q. DOES DR. ZHU REFUTE THE THEORETICAL BASIS FOR YOUR MARKET VALUE CAPITAL STRUCTURE ADJUSTMENT?

A. No.

V. REBUTTAL OF ORS WITNESS MR. LANE KOLLEN

Q. WHAT COST OF DEBT AND CAPITAL STRUCTURE DOES MR. KOLLEN RECOMMEND FOR DESC IN THIS PROCEEDING?

A. Mr. Kollen recommends a cost of debt equal to 5.56 percent and a capital structure with 50 percent debt and 50 percent equity.

Q. DOES MR. KOLLEN RECOMMEND AN ALLOWED RATE OF RETURN ON EQUITY FOR DESC?

A. No.

Q. HOW DOES MR. KOLLEN'S RECOMMENDED COST OF DEBT AND CAPITAL STRUCTURE COMPARE TO DESC'S ACTUAL COST OF DEBT AND CAPITAL STRUCTURE AT MAY 30, 2020?

A.` As discussed in the direct testimony of Iris N. Griffin, Vice President of Financial Management and Integration at DESC, at May 30, 2020, the Company's actual cost of debt, was 6.46 percent, and its actual capital structure contained 46.65 percent debt and 53.35 percent equity.

Q. WHAT RETURN ON EQUITY IS DESC REQUESTING IN THIS PROCEEDING?

A. The Company is requesting a return on equity equal to 10.25 percent.

Q. DOES THE COMPANY'S REQUESTED 10.25 PERCENT RETURN ON EQUITY REFLECT THE FINANCIAL RISK ASSOCIATED WITH DESC'S ACTUAL CAPITAL STRUCTURE AT MAY 30, 2020?

A. Yes.

Q. WOULD DESC HAVE AN OPPORTUNITY TO EARN ITS REQUIRED RETURN ON EQUITY IF THE COMMISSION WERE TO ADOPT A 10.25 PERCENT COST OF EQUITY ALONG WITH MR. KOLLEN'S RECOMMENDED 5.56 PERCENT COST OF DEBT AND 50 PERCENT DEBT/50 PERCENT EQUITY CAPITAL STRUCTURE?

A. No. DESC would only have an opportunity to earn its required return on equity if the Commission were to adopt a 10.25 percent cost of equity, DESC's actual 6.46 percent cost of debt, and actual 46.65 percent debt/53.35 percent equity capital structure. If the Commission were to adopt Mr. Kollen's recommended 5.56 percent cost of debt and 50 percent debt/50 percent equity capital structure, DESC would not have an opportunity to earn its required return on equity.

Q. WOULD INVESTORS REQUIRE A HIGHER RETURN ON EQUITY IF THE COMMISSION WERE TO ADOPT MR. KOLLEN'S RECOMMENDED 5.56 PERCENT COST OF DEBT AND 50 PERCENT DEBT/50 PERCENT EQUITY CAPITAL STRUCTURE?

A. Yes. Investors look at actual cost of debt and actual capital structure in making investment decisions. As risk increases, so does the required rate of return on equity. If the Commission were to adopt Mr. Kollen's recommended 5.56 percent cost of debt and 50 percent debt/50 percent equity capital structure, investors would view those arbitrary changes as increasing

the risk of investing in the Company and would demand a higher return on their equity capital to compensate them for the increased risk.

Q. WOULD A DECISION THAT CAUSES DESC TO UNDEREARN ITS REQUIRED RETURN ON EQUITY BE CONSISTENT WITH THE *HOPE* AND *BLUEFIELD* FAIR RATE OF RETURN STANDARD THAT YOU DISCUSS IN YOUR DIRECT TESTIMONY?

A. No. I therefore recommend that the Commission reject Mr. Kollen's proposed 5.56 percent cost of debt and 50 percent equity/50 percent debt capital structure.

VI. REBUTTAL OF SCEUC WITNESS KEVIN W. O'DONNELL

Q. MR. O'DONNELL ALSO RECOMMENDS THAT THE COMMISSION SHOULD SET THE COMPANY'S RATES BASED ON A COST OF DEBT EQUAL TO 5.56 PERCENT RATHER THAN ON THE COMPANY'S ACTUAL COST OF DEBT EQUAL TO 6.46 PERCENT. (O'DONNELL AT 24) DO YOU AGREE?

A. No. Because the Company's actual cost of debt is 6.46 percent, not 5.56 percent, the Company will not have an opportunity to earn its overall required return on capital if the Commission accepts Mr. O'Donnell's lower recommended cost of debt.

VII. REBUTTAL OF WALMART INC. WITNESS MS. LISA V. PERRY

Q. DOES MS. PERRY PROVIDE ANY COST OF EQUITY ANALYSES TO ESTIMATE DESC'S REQUIRED RETURN ON EQUITY IN THIS PROCEEDING?

A. No. Rather, Ms. Perry provides information on the allowed rates of return on equity decisions for electric utilities that have been found in various jurisdictions throughout the United States from January 2017 through year-to-date 2020.

Q. WHAT AVERAGE ALLOWED RATE OF RETURN ON EQUITY FOR VERTICALLY-INTEGRATED ELECTRIC UTILITIES DOES MS. PERRY REPORT?

A. Ms. Perry reports an average allowed rate of return on equity for vertically-integrated electric utilities over the period 2017 – 2020 equal to 9.71 percent. (Perry at 9)

Q. PLEASE COMPARE THE AVERAGE ALLOWED ROE EQUAL TO 9.71 PERCENT TO THE ROE RECOMMENDATIONS OF OTHER WITNESSES IN THIS PROCEEDING.

A. The average allowed return on equity for electric utilities equal to 9.71 percent is significantly higher than the recommendations of witnesses Woolridge, Rothschild, and Zhu, who recommend allowed returns on equity equal to 8.9 percent, 8.63 percent, and 9.1 percent, respectively. I note that the average allowed return on equity equal to 9.71 percent is equal to the base cost of equity I obtain from my studies updated through October 31, 2020, approximately equal to the 9.8 percent average base cost of equity I obtained from my cost of equity studies filed in my direct testimony, and relatively close to the 10.2 percent to 10.6 percent cost of equity range associated with my financial risk adjustment. (See my rebuttal testimony above in Section I. and Vander Weide direct at 47 – 48) From my cost of equity analyses set forth in my direct and rebuttal testimonies, I conclude that the Company's requested allowed rate of return equal to 10.25 percent is fair and reasonable, and the cost of equity recommendations of witnesses Woolridge, Rothschild, and Zhu, are unreasonably low.

VIII. SUMMARY OF REBUTTAL TESTIMONY

Q. PLEASE SUMMARIZE YOUR REBUTTAL TESTIMONY CONCERNING THE COST OF EQUITY, COST OF DEBT, AND CAPITAL STRUCTURE RECOMMENDATIONS OF DR. WOOLRIDGE, MR. ROTHSCHILD, AND DR. ZHU.

A. Dr. Woolridge recommends that DESC's revenue requirement be based on an 8.9 percent allowed rate of return on equity, a 5.56 percent cost of debt, a capital structure containing 50 percent debt and 50 percent equity, and an overall rate of return equal to 7.23 percent. My rebuttal testimony demonstrates that his recommended: (1) 8.9 percent allowed rate of return on equity understates a reasonable estimate of DESC's cost of equity by at least 135 basis points (10.25 – 8.9 = 135); (2) 5.56 percent cost of debt understates DESC's actual cost of debt by at least 90 basis points (6.46 percent – 5.56 percent = 90 basis points); and (3) 7.23 percent recommended overall rate of return understates the Company's required overall rate of return by 125 basis points (8.48 – 7.23 = 125).

Mr. Rothschild recommends that the Company's revenue requirement be set based on an allowed return on equity equal to 8.63 percent, a 6.46 percent cost of debt, and a 7.55 percent overall rate of return. My rebuttal testimony demonstrates that his recommended: (1) 8.63 percent allowed rate of return on equity understates a reasonable estimate of DESC's cost of equity by at least 162 basis points (10.25 – 8.63 = 162); and (2) 7.55 percent overall rate of return understates the Company's required overall return on capital by 93 basis points.

Dr. Zhu recommends that the Company's revenue requirement be set based on an allowed return on equity equal to 9.1 percent, a 6.46 percent cost of debt, and a 7.87 percent

overall rate of return. My rebuttal testimony demonstrates that his recommended: (1) 9.1 percent allowed rate of return on equity understates a reasonable estimate of DESC's cost of equity by 115 basis points (10.25 – 9.1 = 115); and (2) 7.87 percent overall rate of return understates the Company's required overall return on capital by 61 basis points.

The witnesses' flawed rate of return recommendations and their failure to reflect both the Company's actual cost of debt and capital structure weights causes them to underestimate the Company's overall required rate of return. Thus, the Commission should reject the intervenor witnesses' recommendations on the grounds that these recommendations would produce an overall return that fails to satisfy the *Hope* and *Bluefield* standards and would not allow the Company an opportunity to earn a fair return on the capital that it has invested to serve electric utility customers in South Carolina.

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes, it does.

SUMMARY OF DISCOUNTED CASH FLOW ANALYSIS
FOR ELECTRIC UTILITIES

	COMPANY	MOST RECENT QUARTERLY DIVIDEND (d_0)	STOCK PRICE (P_0)	I/B/E/S FORECAST OF FUTURE EARNINGS GROWTH	DCF MODEL RESULT
1	ALLETE	0.618	54.341	7.00%	12.3%
2	Alliant Energy	0.380	53.492	5.50%	8.8%
3	Amer. Elec. Power	0.700	83.228	5.40%	9.3%
4	Ameren Corp.	0.495	80.385	6.00%	8.8%
5	AVANGRID, Inc.	0.440	50.205	4.60%	8.6%
6	Avista Corp.	0.405	35.454	5.80%	11.0%
7	Black Hills	0.535	56.218	4.69%	9.0%
8	CMS Energy Corp.	0.408	62.093	7.09%	10.1%
9	Consol. Edison	0.765	75.952	2.55%	7.0%
10	Dominion Energy	0.940	79.579	2.74%	8.0%
11	DTE Energy	1.013	118.128	5.95%	9.9%
12	Duke Energy	0.965	86.099	2.31%	7.2%
13	Edison Int'l	0.638	53.112	1.20%	6.4%
14	Entergy Corp.	0.930	100.838	5.40%	9.6%
15	Evergy, Inc.	0.505	54.164	6.80%	11.2%
16	Eversource Energy	0.568	86.052	6.44%	9.5%
17	Fortis Inc.	0.478	53.675	5.25%	9.3%
18	Hawaiian Elec.	0.330	34.107	3.30%	7.6%
19	IDACORP, Inc.	0.670	86.960	2.60%	6.0%
20	MGE Energy	0.370	64.858	4.40%	6.9%
21	NextEra Energy	0.350	71.618	8.14%	10.4%
22	NorthWestern Corp.	0.600	52.631	3.67%	8.8%
23	OGE Energy	0.403	31.517	2.40%	7.9%
24	Otter Tail Corp.	0.370	38.510	9.00%	13.6%
25	Pinnacle West Capital	0.830	76.919	3.38%	8.0%
26	Portland General	0.408	37.971	4.30%	9.0%
27	Sempra Energy	1.045	124.507	6.27%	10.1%
28	Southern Co.	0.640	54.667	4.55%	9.8%
29	WEC Energy Group	0.633	96.694	5.95%	8.9%
30	Xcel Energy Inc.	0.430	70.340	5.85%	8.6%
31	Average				9.0%

Notes:

d_0	=	Most recent quarterly dividend.
d_1,d_2,d_3,d_4	=	Next four quarterly dividends, calculated by multiplying the last four quarterly dividends by the factor (1 + g).
P_0	=	Average of the monthly high and low stock prices during the three months ending October 2020 per Refinitiv (formerly Thomson Reuters).
FC	=	Flotation cost allowance (five percent) as a percent of stock price.
g	=	I/B/E/S forecast of future earnings growth October 2020 from Refinitiv.
k	=	Cost of equity using the quarterly version of the DCF model.

$$k = \frac{d_1(1+k)^{.75} + d_2(1+k)^{.50} + d_3(1+k)^{.25} + d_4}{P_0(1-FC)} + g$$

My analysis does not include results for companies that do not have an investment-grade bond rating, a positive I/B/E/S long-term growth forecast, or results that are less than one hundred basis points above the forecasted bond yield for a company's rating.

EX ANTE RISK PREMIUM APPROACH: COMPARISON OF DCF EXPECTED RETURN ON AN INVESTMENT IN ELECTRIC UTILITIES TO THE INTEREST RATE ON MOODY'S A-RATED UTILITY BONDS

In this analysis, I compute an electric utility equity risk premium by studying the relationship between the DCF estimated cost of equity for an electric utility proxy group to the interest rate on A-rated utility bonds. For each month in my September 1999 through October 2020 study period:

DCF	=	Average DCF-estimated cost of equity on a portfolio of proxy companies;
Bond Yield	=	Yield to maturity on an investment in A-rated utility bonds; and
Risk Premium	=	DCF cost of equity – bond yield.

A more detailed description of my *ex ante* risk premium method is contained in Exhibit___ (JVW-6)

LINE	DATE	DCF	BOND YIELD	RISK PREMIUM
1	Sep-99	0.1157	0.0793	0.0364
2	Oct-99	0.1161	0.0806	0.0355
3	Nov-99	0.1192	0.0794	0.0398
4	Dec-99	0.1236	0.0814	0.0422
5	Jan-00	0.1221	0.0835	0.0386
6	Feb-00	0.1269	0.0825	0.0444
7	Mar-00	0.1313	0.0828	0.0485
8	Apr-00	0.1237	0.0829	0.0408
9	May-00	0.1227	0.0870	0.0357
10	Jun-00	0.1242	0.0836	0.0406
11	Jul-00	0.1247	0.0825	0.0422
12	Aug-00	0.1228	0.0813	0.0415
13	Sep-00	0.1164	0.0823	0.0341
14	Oct-00	0.1170	0.0814	0.0356
15	Nov-00	0.1191	0.0811	0.0380
16	Dec-00	0.1166	0.0784	0.0382
17	Jan-01	0.1194	0.0780	0.0414
18	Feb-01	0.1203	0.0774	0.0429
19	Mar-01	0.1207	0.0768	0.0439
20	Apr-01	0.1233	0.0794	0.0439
21	May-01	0.1279	0.0799	0.0480
22	Jun-01	0.1285	0.0785	0.0500
23	Jul-01	0.1295	0.0778	0.0517
24	Aug-01	0.1302	0.0759	0.0543
25	Sep-01	0.1321	0.0775	0.0546
26	Oct-01	0.1313	0.0763	0.0550
27	Nov-01	0.1296	0.0757	0.0539
28	Dec-01	0.1292	0.0783	0.0509
29	Jan-02	0.1274	0.0766	0.0508
30	Feb-02	0.1285	0.0754	0.0531
31	Mar-02	0.1248	0.0776	0.0472
32	Apr-02	0.1227	0.0757	0.0470
33	May-02	0.1236	0.0752	0.0484
34	Jun-02	0.1254	0.0741	0.0513
35	Jul-02	0.1337	0.0731	0.0606
36	Aug-02	0.1300	0.0717	0.0583
37	Sep-02	0.1272	0.0708	0.0564
38	Oct-02	0.1291	0.0723	0.0568
39	Nov-02	0.1242	0.0714	0.0528
40	Dec-02	0.1226	0.0707	0.0519
41	Jan-03	0.1195	0.0706	0.0489
42	Feb-03	0.1233	0.0693	0.0540
43	Mar-03	0.1212	0.0679	0.0533
44	Apr-03	0.1170	0.0664	0.0506
45	May-03	0.1095	0.0636	0.0459
46	Jun-03	0.1047	0.0621	0.0426

LINE	DATE	DCF	BOND YIELD	RISK PREMIUM
47	Jul-03	0.1072	0.0657	0.0415
48	Aug-03	0.1064	0.0678	0.0386
49	Sep-03	0.1029	0.0656	0.0373
50	Oct-03	0.1009	0.0643	0.0366
51	Nov-03	0.0985	0.0637	0.0348
52	Dec-03	0.0946	0.0627	0.0319
53	Jan-04	0.0921	0.0615	0.0306
54	Feb-04	0.0916	0.0615	0.0301
55	Mar-04	0.0912	0.0597	0.0315
56	Apr-04	0.0925	0.0635	0.0290
57	May-04	0.0962	0.0662	0.0300
58	Jun-04	0.0961	0.0646	0.0315
59	Jul-04	0.0953	0.0627	0.0326
60	Aug-04	0.0966	0.0614	0.0352
61	Sep-04	0.0951	0.0598	0.0353
62	Oct-04	0.0953	0.0594	0.0359
63	Nov-04	0.0918	0.0597	0.0321
64	Dec-04	0.0920	0.0592	0.0328
65	Jan-05	0.0925	0.0578	0.0347
66	Feb-05	0.0917	0.0561	0.0356
67	Mar-05	0.0918	0.0583	0.0335
68	Apr-05	0.0924	0.0564	0.0360
69	May-05	0.0910	0.0553	0.0356
70	Jun-05	0.0911	0.0540	0.0371
71	Jul-05	0.0899	0.0551	0.0348
72	Aug-05	0.0900	0.0550	0.0350
73	Sep-05	0.0923	0.0552	0.0371
74	Oct-05	0.0934	0.0579	0.0355
75	Nov-05	0.0981	0.0588	0.0393
76	Dec-05	0.0980	0.0580	0.0400
77	Jan-06	0.0980	0.0575	0.0405
78	Feb-06	0.1071	0.0582	0.0489
79	Mar-06	0.1055	0.0598	0.0457
80	Apr-06	0.1075	0.0629	0.0446
81	May-06	0.1087	0.0642	0.0445
82	Jun-06	0.1117	0.0640	0.0477
83	Jul-06	0.1110	0.0637	0.0473
84	Aug-06	0.1072	0.0620	0.0452
85	Sep-06	0.1111	0.0600	0.0511
86	Oct-06	0.1074	0.0598	0.0476
87	Nov-06	0.1078	0.0580	0.0498
88	Dec-06	0.1071	0.0581	0.0490
89	Jan-07	0.1096	0.0596	0.0500
90	Feb-07	0.1085	0.0590	0.0495
91	Mar-07	0.1094	0.0585	0.0509
92	Apr-07	0.1042	0.0597	0.0445
93	May-07	0.1068	0.0599	0.0469
94	Jun-07	0.1123	0.0630	0.0493
95	Jul-07	0.1130	0.0625	0.0505
96	Aug-07	0.1104	0.0624	0.0480
97	Sep-07	0.1078	0.0618	0.0460
98	Oct-07	0.1084	0.0611	0.0473
99	Nov-07	0.1116	0.0597	0.0519
100	Dec-07	0.1132	0.0616	0.0516
101	Jan-08	0.1193	0.0602	0.0591
102	Feb-08	0.1133	0.0621	0.0512
103	Mar-08	0.1170	0.0621	0.0549
104	Apr-08	0.1159	0.0629	0.0530
105	May-08	0.1162	0.0627	0.0535
106	Jun-08	0.1136	0.0638	0.0499
107	Jul-08	0.1172	0.0640	0.0532
108	Aug-08	0.1191	0.0637	0.0554

LINE	DATE	DCF	BOND YIELD	RISK PREMIUM
109	Sep-08	0.1185	0.0649	0.0536
110	Oct-08	0.1280	0.0756	0.0524
111	Nov-08	0.1312	0.0760	0.0552
112	Dec-08	0.1301	0.0654	0.0647
113	Jan-09	0.1241	0.0639	0.0602
114	Feb-09	0.1269	0.0630	0.0639
115	Mar-09	0.1286	0.0642	0.0644
116	Apr-09	0.1266	0.0648	0.0617
117	May-09	0.1242	0.0649	0.0593
118	Jun-09	0.1220	0.0620	0.0600
119	Jul-09	0.1174	0.0597	0.0577
120	Aug-09	0.1158	0.0571	0.0587
121	Sep-09	0.1152	0.0553	0.0599
122	Oct-09	0.1153	0.0555	0.0598
123	Nov-09	0.1196	0.0564	0.0633
124	Dec-09	0.1095	0.0579	0.0516
125	Jan-10	0.1112	0.0577	0.0535
126	Feb-10	0.1091	0.0587	0.0504
127	Mar-10	0.1076	0.0584	0.0492
128	Apr-10	0.1111	0.0582	0.0529
129	May-10	0.1093	0.0552	0.0541
130	Jun-10	0.1088	0.0546	0.0541
131	Jul-10	0.1078	0.0526	0.0552
132	Aug-10	0.1057	0.0501	0.0557
133	Sep-10	0.1059	0.0501	0.0558
134	Oct-10	0.1044	0.0510	0.0534
135	Nov-10	0.1051	0.0536	0.0514
136	Dec-10	0.1053	0.0557	0.0497
137	Jan-11	0.1044	0.0557	0.0487
138	Feb-11	0.1041	0.0568	0.0473
139	Mar-11	0.1044	0.0556	0.0488
140	Apr-11	0.1020	0.0555	0.0465
141	May-11	0.0994	0.0532	0.0462
142	Jun-11	0.1043	0.0526	0.0517
143	Jul-11	0.1019	0.0527	0.0492
144	Aug-11	0.1050	0.0469	0.0581
145	Sep-11	0.1016	0.0448	0.0568
146	Oct-11	0.1032	0.0452	0.0580
147	Nov-11	0.1014	0.0425	0.0589
148	Dec-11	0.1024	0.0435	0.0589
149	Jan-12	0.1016	0.0434	0.0582
150	Feb-12	0.0974	0.0436	0.0538
151	Mar-12	0.0971	0.0448	0.0523
152	Apr-12	0.0994	0.0440	0.0554
153	May-12	0.0981	0.0420	0.0561
154	Jun-12	0.0962	0.0408	0.0554
155	Jul-12	0.0963	0.0393	0.0570
156	Aug-12	0.0972	0.0400	0.0572
157	Sep-12	0.0968	0.0402	0.0566
158	Oct-12	0.0978	0.0391	0.0587
159	Nov-12	0.0935	0.0384	0.0551
160	Dec-12	0.0962	0.0400	0.0562
161	Jan-13	0.0968	0.0415	0.0553
162	Feb-13	0.0956	0.0418	0.0538
163	Mar-13	0.0976	0.0420	0.0556
164	Apr-13	0.0966	0.0400	0.0566
165	May-13	0.0970	0.0417	0.0553
166	Jun-13	0.0990	0.0453	0.0537
167	Jul-13	0.0978	0.0468	0.0510
168	Aug-13	0.0958	0.0473	0.0485
169	Sep-13	0.0950	0.0480	0.0470
170	Oct-13	0.0925	0.0470	0.0455

LINE	DATE	DCF	BOND YIELD	RISK PREMIUM
171	Nov-13	0.0931	0.0477	0.0454
172	Dec-13	0.0931	0.0481	0.0450
173	Jan-14	0.0922	0.0463	0.0459
174	Feb-14	0.0944	0.0453	0.0491
175	Mar-14	0.0983	0.0451	0.0532
176	Apr-14	0.0970	0.0441	0.0529
177	May-14	0.0983	0.0426	0.0557
178	Jun-14	0.0972	0.0429	0.0543
179	Jul-14	0.0966	0.0423	0.0543
180	Aug-14	0.0978	0.0413	0.0565
181	Sep-14	0.0962	0.0424	0.0538
182	Oct-14	0.1013	0.0406	0.0607
183	Nov-14	0.0995	0.0409	0.0586
184	Dec-14	0.0984	0.0395	0.0589
185	Jan-15	0.0972	0.0358	0.0614
186	Feb-15	0.0983	0.0367	0.0616
187	Mar-15	0.0985	0.0374	0.0611
188	Apr-15	0.1005	0.0375	0.0630
189	May-15	0.0983	0.0417	0.0566
190	Jun-15	0.0963	0.0439	0.0524
191	Jul-15	0.0956	0.0440	0.0516
192	Aug-15	0.0966	0.0425	0.0541
193	Sep-15	0.0941	0.0439	0.0502
194	Oct-15	0.0937	0.0429	0.0508
195	Nov-15	0.0938	0.0440	0.0498
196	Dec-15	0.0941	0.0435	0.0506
197	Jan-16	0.0981	0.0427	0.0554
198	Feb-16	0.0977	0.0411	0.0566
199	Mar-16	0.0974	0.0416	0.0558
200	Apr-16	0.0960	0.0400	0.0560
201	May-16	0.0943	0.0393	0.0550
202	Jun-16	0.0940	0.0378	0.0562
203	Jul-16	0.0930	0.0357	0.0573
204	Aug-16	0.0930	0.0359	0.0571
205	Sep-16	0.0932	0.0366	0.0566
206	Oct-16	0.0946	0.0377	0.0569
207	Nov-16	0.0933	0.0408	0.0525
208	Dec-16	0.0940	0.0427	0.0513
209	Jan-17	0.0934	0.0414	0.0520
210	Feb-17	0.0944	0.0418	0.0526
211	Mar-17	0.0942	0.0423	0.0519
212	Apr-17	0.0930	0.0412	0.0518
213	May-17	0.0970	0.0412	0.0558
214	Jun-17	0.0965	0.0394	0.0571
215	Jul-17	0.0956	0.0399	0.0557
216	Aug-17	0.0936	0.0386	0.0550
217	Sep-17	0.0960	0.0387	0.0573
218	Oct-17	0.0963	0.0391	0.0572
219	Nov-17	0.0924	0.0383	0.0541
220	Dec-17	0.0928	0.0379	0.0549
221	Jan-18	0.0954	0.0386	0.0568
222	Feb-18	0.1013	0.0409	0.0604
223	Mar-18	0.0999	0.0413	0.0586
224	Apr-18	0.1009	0.0417	0.0592
225	May-18	0.1000	0.0428	0.0572
226	Jun-18	0.1009	0.0427	0.0582
227	Jul-18	0.0992	0.0427	0.0565
228	Aug-18	0.0989	0.0426	0.0563
229	Sep-18	0.0996	0.0432	0.0564
230	Oct-18	0.1003	0.0445	0.0558
231	Nov-18	0.1016	0.0452	0.0564
232	Dec-18	0.1020	0.0437	0.0583

LINE	DATE	DCF	BOND YIELD	RISK PREMIUM
233	Jan-19	0.1010	0.0435	0.0575
234	Feb-19	0.0972	0.0425	0.0547
235	Mar-19	0.0968	0.0416	0.0552
236	Apr-19	0.0940	0.0408	0.0532
237	May-19	0.0906	0.0398	0.0508
238	Jun-19	0.0902	0.0382	0.0520
239	Jul-19	0.0909	0.0369	0.0540
240	Aug-19	0.0887	0.0329	0.0558
241	Sep-19	0.0912	0.0337	0.0575
242	Oct-19	0.0872	0.0339	0.0533
243	Nov-19	0.0860	0.0343	0.0517
244	Dec-19	0.0859	0.0340	0.0519
245	Jan-20	0.0856	0.0329	0.0527
246	Feb-20	0.0867	0.0311	0.0556
247	Mar-20	0.0930	0.0350	0.0580
248	Apr-20	0.0909	0.0319	0.0590
249	May-20	0.0934	0.0314	0.0620
250	Jun-20	0.0900	0.0307	0.0593
251	Jul-20	0.0898	0.0274	0.0624
252	Aug-20	0.0906	0.0273	0.0633
253	Sep-20	0.0920	0.0284	0.0636
254	Oct-20	0.0898	0.0295	0.0603

	Ex Ante Risk Premium Cost of Equity		
1	Constant coefficient	8.17%	
2	Bond coefficient	-0.5783	
3	Forecast bond yield =	4.40%	
4	Bond coefficient x Bond yield =	-2.54%	Line 2 (bond coefficient) x Line 3 (bond yield)
5	Ex Ante Risk Premium	5.63%	Line 1+Line 4
6	Forecast bond yield =	4.40%	
7	Ex Ante Risk Premium Cost of Equity =	10.0%	Expected risk premium + bond yield

Notes: Utility bond yield information from *Mergent Bond Record* (formerly Moody's). See Exhibit ___ (JVW-6) in my direct testimony for a description of my *ex ante* risk premium approach. DCF results are calculated using a quarterly DCF model.

EX POST RISK PREMIUM COST OF EQUITY

Risk Premium S&P 500 (See Exhibit No. __(JVW-9 Direct Testimony)	4.70%
Risk Premium S&P Utilities (See Exhibit No. __(JVW-10 Direct Testimony)	4.00%
Average Risk Premium	4.35%
Forecast Yield A-rated utility bond	4.40%
Flotation	0.20%
Risk Premium Cost of Equity	8.95%

CALCULATION OF CAPITAL ASSET PRICING MODEL COST OF EQUITY USING AN HISTORICAL RISK PREMIUM

LINE	COMPANY	VALUE LINE BETA	RISK-FREE RATE	MARKET RISK PREMIUM	BETA X RISK PREMIUM	CAPM COST OF EQUITY
1	ALLETE	0.85	2.9%	7.2%	6.1%	9.3%
2	Alliant Energy	0.85	2.9%	7.2%	6.1%	9.3%
3	Amer. Elec. Power	0.75	2.9%	7.2%	5.4%	8.5%
4	Ameren Corp.	0.80	2.9%	7.2%	5.8%	8.9%
5	CenterPoint Energy	1.10	2.9%	7.2%	7.9%	11.1%
6	CMS Energy Corp.	0.80	2.9%	7.2%	5.8%	8.9%
7	DTE Energy	0.90	2.9%	7.2%	6.5%	9.6%
8	Entergy Corp.	0.95	2.9%	7.2%	6.8%	10.0%
9	Evergy	1.00	2.9%	7.2%	7.2%	10.3%
10	Fortis Inc.	0.80	2.9%	7.2%	5.8%	8.9%
11	MGE Energy	0.70	2.9%	7.2%	5.0%	8.2%
12	OGE Energy	1.05	2.9%	7.2%	7.6%	10.7%
13	Otter Tail Corp.	0.85	2.9%	7.2%	6.1%	9.3%
14	WEC Energy Group	0.80	2.9%	7.2%	5.8%	8.9%
15	AVANGRID, Inc.	0.80	2.9%	7.2%	5.8%	8.9%
16	Consol. Edison	0.75	2.9%	7.2%	5.4%	8.5%
17	Dominion Energy	0.80	2.9%	7.2%	5.8%	8.9%
18	Duke Energy	0.85	2.9%	7.2%	6.1%	9.3%
19	Eversource Energy	0.90	2.9%	7.2%	6.5%	9.6%
20	Exelon Corp.	0.95	2.9%	7.2%	6.8%	10.0%
21	FirstEnergy Corp.	0.85	2.9%	7.2%	6.1%	9.3%
22	NextEra Energy	0.85	2.9%	7.2%	6.1%	9.3%
23	PPL Corp.	1.10	2.9%	7.2%	7.9%	11.1%
24	Public Serv. Enterprise	0.90	2.9%	7.2%	6.5%	9.6%
25	Southern Co.	0.90	2.9%	7.2%	6.5%	9.6%
26	Avista Corp.	0.90	2.9%	7.2%	6.5%	9.6%
27	Black Hills	0.95	2.9%	7.2%	6.8%	10.0%
28	Edison Int'l	0.90	2.9%	7.2%	6.5%	9.6%
29	Hawaiian Elec.	0.80	2.9%	7.2%	5.8%	8.9%
30	IDACORP, Inc.	0.80	2.9%	7.2%	5.8%	8.9%
31	NorthWestern Corp.	0.90	2.9%	7.2%	6.5%	9.6%
32	Pinnacle West Capital	0.85	2.9%	7.2%	6.1%	9.3%
33	Portland General	0.85	2.9%	7.2%	6.1%	9.3%
34	Sempra Energy	0.95	2.9%	7.2%	6.8%	10.0%
35	Xcel Energy Inc.	0.80	2.9%	7.2%	5.8%	8.9%
36	Cost of Equity 0.87 Beta	0.87	2.9%	7.2%	6.3%	9.4%
37	Cost of Equity 0.89 Beta	0.89	2.9%	7.2%	6.4%	9.6%
38	Average Historical CAPM Cost of Equity					**9.5%**

Notes: Historical Ibbotson® SBBI® risk premium including years 1926 through year end 2019 from 2020 SBBI Yearbook. Value Line beta for comparable companies from Value Line. Utility beta equal to 0.89 calculated per Exhibit ___ (JVW-11). Treasury bond yield forecast from data in Value Line Selection & Opinion, August 28, 2020, and Energy Information Administration, 2020, determined as follows. Value Line forecasts a yield on 10-year Treasury notes equal to 1.5 percent. The spread between the yield on 10-year Treasury notes (0.68 percent) and 20-year Treasury bonds (1.21 percent) is 53 basis points. Adding 53 basis points to Value Line's 1.5 percent forecasted yield on 20-year Treasury notes produces a forecasted yield of 2 percent for 20-year Treasury bonds (see Value Line Investment Survey, Selection & Opinion, August 28, 2020). EIA forecasts a yield of 3.28 percent on 10-year Treasury notes. Adding the 53 basis point spread between 10-year Treasury notes and 20-year Treasury bonds to the EIA forecast of 3.28 percent for 10-year Treasury notes produces an EIA forecast for 20-year Treasury bonds equal to 3.8 percent. The average of the forecasts is 2.9 percent (2 percent using Value Line data and 3.8 percent using EIA data).

CALCULATION OF CAPITAL ASSET PRICING MODEL COST OF EQUITY USING DCF ESTIMATE OF THE EXPECTED RATE OF RETURN ON THE MARKET PORTFOLIO

LINE	COMPANY	VALUE LINE BETA	RISK-FREE RATE	DCF S&P 500	MARKET RISK PREMIUM	BETA X RISK PREMIUM	CAPM COST OF EQUITY
1	ALLETE	0.85	2.9%	11.6%	8.7%	7.36%	10.5%
2	Alliant Energy	0.85	2.9%	11.6%	8.7%	7.36%	10.5%
3	Amer. Elec. Power	0.75	2.9%	11.6%	8.7%	6.50%	9.6%
4	Ameren Corp.	0.80	2.9%	11.6%	8.7%	6.93%	10.1%
5	CenterPoint Energy	1.10	2.9%	11.6%	8.7%	9.53%	12.7%
6	CMS Energy Corp.	0.80	2.9%	11.6%	8.7%	6.93%	10.1%
7	DTE Energy	0.90	2.9%	11.6%	8.7%	7.79%	10.9%
8	Entergy Corp.	0.95	2.9%	11.6%	8.7%	8.23%	11.4%
9	Evergy	1.00	2.9%	11.6%	8.7%	8.66%	11.8%
10	Fortis Inc.	0.80	2.9%	11.6%	8.7%	6.93%	10.1%
11	MGE Energy	0.70	2.9%	11.6%	8.7%	6.06%	9.2%
12	OGE Energy	1.05	2.9%	11.6%	8.7%	9.09%	12.2%
13	Otter Tail Corp.	0.85	2.9%	11.6%	8.7%	7.36%	10.5%
14	WEC Energy Group	0.80	2.9%	11.6%	8.7%	6.93%	10.1%
15	AVANGRID, Inc.	0.80	2.9%	11.6%	8.7%	6.93%	10.1%
16	Consol. Edison	0.75	2.9%	11.6%	8.7%	6.50%	9.6%
17	Dominion Energy	0.80	2.9%	11.6%	8.7%	6.93%	10.1%
18	Duke Energy	0.85	2.9%	11.6%	8.7%	7.36%	10.5%
19	Eversource Energy	0.90	2.9%	11.6%	8.7%	7.79%	10.9%
20	Exelon Corp.	0.95	2.9%	11.6%	8.7%	8.23%	11.4%
21	FirstEnergy Corp.	0.85	2.9%	11.6%	8.7%	7.36%	10.5%
22	NextEra Energy	0.85	2.9%	11.6%	8.7%	7.36%	10.5%
23	PPL Corp.	1.10	2.9%	11.6%	8.7%	9.53%	12.7%
24	Public Serv. Enterprise	0.90	2.9%	11.6%	8.7%	7.79%	10.9%
25	Southern Co.	0.90	2.9%	11.6%	8.7%	7.79%	10.9%
26	Avista Corp.	0.90	2.9%	11.6%	8.7%	7.79%	10.9%
27	Black Hills	0.95	2.9%	11.6%	8.7%	8.23%	11.4%
28	Edison Int'l	0.90	2.9%	11.6%	8.7%	7.79%	10.9%
29	Hawaiian Elec.	0.80	2.9%	11.6%	8.7%	6.93%	10.1%
30	IDACORP, Inc.	0.80	2.9%	11.6%	8.7%	6.93%	10.1%
31	NorthWestern Corp.	0.90	2.9%	11.6%	8.7%	7.79%	10.9%
32	Pinnacle West Capital	0.85	2.9%	11.6%	8.7%	7.36%	10.5%
33	Portland General	0.85	2.9%	11.6%	8.7%	7.36%	10.5%
34	Sempra Energy	0.95	2.9%	11.6%	8.7%	8.23%	11.4%
35	Xcel Energy Inc.	0.80	2.9%	11.6%	8.7%	6.93%	10.1%
36	Cost of Equity 0.88 Beta	0.87	2.9%	11.6%	8.7%	7.58%	10.7%
37	Cost of Equity 0.89 Beta	0.89	2.9%	11.6%	8.7%	7.74%	10.9%
38	Average DCF CAPM Cost of Equity						10.8%

Notes: Value Line beta for comparable companies from Value Line. Utility beta equal to 0.89 calculated per Exhibit ___(JVW-11). Treasury bond yield forecast from data in Value Line Selection & Opinion, August 28, 2020, and Energy Information Administration, 2020, determined as follows. Value Line forecasts a yield on 10-year Treasury notes equal to 1.5 percent. The spread between the yield on 10-year Treasury notes (0.68 percent) and 20-year Treasury bonds (1.21 percent) is 53 basis points. Adding 53 basis points to Value Line's 1.5 percent forecasted yield on 20-year Treasury notes produces a forecasted yield of 2 percent for 20-year Treasury bonds (see Value Line Investment Survey, Selection & Opinion, August 28, 2020). EIA forecasts a yield of 3.28 percent on 10-year Treasury notes. Adding the 53 basis point spread between 10-year Treasury notes and 20-year Treasury bonds to the EIA forecast of 3.28 percent for 10-year Treasury notes produces an EIA forecast for 20-year Treasury bonds equal to 3.8 percent. The average of the forecasts is 2.9 percent (2 percent using Value Line data and 3.8 percent using EIA data).

EXHIBIT NO. ___ (JVW-14) (CONTINUED)
SUMMARY OF DISCOUNTED CASH FLOW ANALYSIS
FOR S&P 500 COMPANIES

	COMPANY	STOCK PRICE (P_0)	D_0	FORECAST OF FUTURE EARNINGS GROWTH	MODEL RESULT	MARKET CAP $(MILS)
1	3M	162.90	5.88	3.31%	7.1%	98,619
2	ABBOTT LABORATORIES	106.30	1.44	14.90%	16.5%	194,174
3	ABBVIE	89.73	4.72	9.38%	15.2%	152,252
4	ACCENTURE CLASS A	228.90	3.52	9.51%	11.2%	151,576
5	ADV.AUTO PARTS	154.54	1.00	11.90%	12.6%	10,716
6	AES	17.93	0.57	7.65%	11.1%	13,236
7	AFLAC	36.56	1.12	2.53%	5.7%	26,527
8	AGILENT TECHS.	100.24	0.72	9.40%	10.2%	32,897
9	AIR PRDS.& CHEMS.	291.18	5.36	10.33%	12.4%	65,857
10	ALBEMARLE	89.96	1.54	15.00%	17.0%	9,936
11	ALLIANT ENERGY (XSC)	53.49	1.52	5.50%	8.5%	13,703
12	ALLSTATE ORD SHS	93.49	2.16	5.46%	7.9%	28,914
13	ALTRIA GROUP	40.77	3.44	6.10%	15.3%	73,462
14	AMCOR	10.94	0.46	5.45%	10.0%	18,038
15	AMER.ELEC.PWR.	83.23	2.80	5.40%	9.0%	45,408
16	AMEREN	80.39	2.06	6.00%	8.7%	20,357
17	AMERICAN EXPRESS	99.53	1.72	9.40%	11.3%	84,469
18	AMERICAN INTL.GP.	29.67	1.28	4.59%	9.2%	26,093
19	AMERICAN TOWER	247.08	4.56	15.18%	17.3%	107,663
20	AMERICAN WATER WORKS	146.35	2.20	8.30%	9.9%	28,217
21	AMERIPRISE FINL.	157.98	4.16	9.11%	12.0%	20,440
22	AMERISOURCEBERGEN	97.96	1.68	8.17%	10.0%	20,316
23	AMGEN	242.85	6.40	6.84%	9.7%	138,060
24	ANALOG DEVICES	118.31	2.48	8.45%	10.7%	45,692
25	ANTHEM	276.58	3.80	14.52%	16.1%	74,665
26	AON CLASS A	199.34	1.84	7.13%	8.1%	49,268
27	APPLE	118.85	0.82	12.60%	13.4%	2,023,555
28	APPLIED MATS.	62.16	0.88	20.08%	21.8%	57,537
29	ARTHUR J GALLAGHER	105.46	1.80	11.42%	13.3%	20,919
30	AT&T	28.94	2.08	0.29%	7.7%	194,726
31	ATMOS ENERGY	97.39	2.30	7.25%	9.8%	11,656
32	AUTOMATIC DATA PROC.	140.20	3.64	10.57%	13.5%	63,798
33	AVERY DENNISON	123.91	2.32	7.96%	10.0%	11,186
34	BAKER HUGHES A	14.56	0.72	3.17%	8.4%	9,012
35	BALL	82.22	0.60	10.75%	11.6%	29,855
36	BANK OF NEW YORK MELLON	36.29	1.24	1.68%	5.2%	33,680
37	BAXTER INTL.	81.54	0.98	10.00%	11.3%	41,420
38	BECTON DICKINSON	242.81	3.16	6.40%	7.8%	68,696
39	BEST BUY	111.63	2.20	7.40%	9.5%	30,892
40	BLACKROCK	590.09	14.52	9.92%	12.6%	100,248
41	BORGWARNER	39.18	0.68	3.91%	5.7%	8,019
42	BROADCOM	353.75	13.00	7.90%	11.9%	153,164
43	BROWN-FORMAN 'B'	73.87	0.70	6.85%	7.9%	23,496
44	CARDINAL HEALTH	49.90	1.94	4.66%	8.8%	14,268
45	CDW	118.18	1.52	9.10%	10.5%	18,636
46	CERNER	71.45	0.72	10.50%	11.6%	22,791
47	CH ROBINSON WWD.	97.75	2.04	4.13%	6.3%	13,513
48	CHURCH & DWIGHT CO.	92.57	0.96	9.50%	10.6%	23,047
49	CIGNA	174.53	0.04	10.94%	11.0%	65,325
50	CINTAS	325.79	2.55	11.95%	12.8%	36,451
51	CISCO SYSTEMS	41.01	1.44	6.18%	10.0%	170,166
52	CITRIX SYS.	136.71	1.40	9.37%	10.5%	17,080
53	CLOROX	218.95	4.44	3.87%	6.0%	27,084
54	CME GROUP	166.26	3.40	4.25%	6.4%	60,245
55	CMS ENERGY	62.09	1.63	7.09%	9.9%	18,692
56	COCA COLA	49.14	1.64	2.98%	6.5%	214,901
57	COLGATE-PALM.	77.70	1.76	5.81%	8.2%	68,839
58	COMCAST A	44.38	0.92	5.24%	7.4%	208,021

	COMPANY	STOCK PRICE (P_0)	D_0	FORECAST OF FUTURE EARNINGS GROWTH	MODEL RESULT	MARKET CAP $(MILS)
59	CONAGRA BRANDS	36.96	1.10	7.14%	10.4%	18,520
60	CONSOLIDATED EDISON	75.95	3.06	2.55%	6.7%	27,328
61	CONSTELLATION BRANDS 'A'	180.88	3.00	7.92%	9.7%	30,762
62	CORTEVA	29.15	0.52	5.31%	7.2%	25,511
63	COSTCO WHOLESALE	350.99	2.80	7.04%	7.9%	168,346
64	CROWN CASTLE INTL.	162.41	4.80	18.59%	22.1%	70,043
65	CSX	77.18	1.04	3.81%	5.2%	61,266
66	CVS HEALTH	60.58	2.00	6.34%	9.9%	77,986
67	D R HORTON	72.41	0.70	18.60%	19.8%	28,038
68	DANAHER	211.43	0.72	13.06%	13.4%	161,575
69	DEERE	213.46	3.04	8.46%	10.0%	75,229
70	DENTSPLY SIRONA	45.31	0.40	4.27%	5.2%	9,981
71	DIAMONDBACK ENERGY	34.97	1.50	13.45%	18.4%	4,623
72	DOLLAR GENERAL	205.16	1.44	14.79%	15.6%	55,213
73	DOMINION ENERGY	79.58	3.76	2.74%	7.7%	68,244
74	DOMINO'S PIZZA	403.38	3.12	15.10%	16.0%	15,738
75	DTE ENERGY	118.13	4.05	5.95%	9.6%	23,092
76	DUKE ENERGY	86.10	3.86	2.31%	7.0%	67,932
77	EASTMAN CHEMICAL	77.89	2.64	3.31%	6.9%	11,706
78	EBAY	53.47	0.64	15.92%	17.3%	39,074
79	ECOLAB	195.85	1.88	8.11%	9.2%	58,382
80	EDISON INTL.	53.11	2.55	1.20%	6.1%	21,995
81	ELI LILLY	148.40	2.96	12.98%	15.3%	139,759
82	ENTERGY	100.84	3.72	5.40%	9.3%	21,359
83	EQUIFAX	159.02	1.56	6.77%	7.8%	19,869
84	ESTEE LAUDER COS.'A'	216.25	1.92	14.09%	15.1%	50,685
85	EVEREST RE GP.	212.54	6.20	4.16%	7.2%	8,026
86	EVERGY	54.16	2.02	6.80%	10.8%	12,457
87	EVERSOURCE ENERGY	86.05	2.27	6.44%	9.3%	31,327
88	EXPEDITOR INTL.OF WASH.	89.04	1.04	6.59%	7.8%	15,641
89	EXXON MOBIL	37.76	3.48	3.26%	13.1%	144,183
90	FASTENAL	46.74	1.00	7.40%	9.7%	25,982
91	FIDELITY NAT.INFO.SVS.	143.07	1.40	12.59%	13.7%	89,279
92	FIRST REPUBLIC BANK	114.98	0.80	8.87%	9.6%	21,821
93	FLIR SYSTEMS	36.84	0.68	6.00%	8.0%	4,875
94	FLOWSERVE	29.10	0.80	2.45%	5.3%	3,756
95	FMC	107.56	1.76	9.54%	11.3%	14,111
96	FORTUNE BNS.HM.& SCTY.	83.29	0.96	7.30%	8.5%	12,540
97	GARMIN	100.17	2.44	4.32%	6.9%	18,955
98	GENERAL DYNAMICS	145.50	4.40	3.88%	7.1%	40,819
99	GENERAL MILLS	62.09	2.04	5.05%	8.5%	38,129
100	GLOBAL PAYMENTS	173.32	0.78	17.05%	17.6%	52,992
101	GLOBE LIFE	82.15	0.75	6.54%	7.5%	8,866
102	GOLDMAN SACHS GP.	202.50	5.00	8.30%	11.0%	70,950
103	HANESBRANDS	15.91	0.60	2.03%	5.9%	5,988
104	HASBRO	81.44	2.72	8.40%	12.1%	12,003
105	HERSHEY	144.34	3.22	6.78%	9.2%	22,100
106	HOME DEPOT	277.05	6.00	5.95%	8.3%	309,654
107	HP	18.78	0.70	9.34%	13.5%	26,921
108	HUMANA	411.52	2.50	12.45%	13.1%	57,906
109	HUNT JB TRANSPORT SVS.	133.91	1.08	10.85%	11.7%	13,531
110	IDEX	178.09	2.00	13.00%	14.3%	14,553
111	IHS MARKIT	80.70	0.68	11.12%	12.1%	32,395
112	INTEL	50.02	1.32	8.62%	11.5%	221,948
113	INTERCONTINENTAL EX.	100.27	1.20	10.30%	11.6%	56,854
114	INTERNATIONAL BUS.MCHS.	123.41	6.52	2.85%	8.4%	112,211
115	INTUIT	329.26	2.36	7.58%	8.4%	89,315
116	JACOBS ENGR.	92.32	0.76	10.46%	11.4%	12,934
117	JOHNSON & JOHNSON	147.57	4.04	4.33%	7.2%	389,921
118	JOHNSON CONTROLS INTL.	41.31	1.04	11.73%	14.6%	32,009
119	JUNIPER NETWORKS	23.08	0.80	1.80%	5.4%	7,441
120	KANSAS CITY SOUTHERN	183.62	1.60	9.67%	10.6%	16,756

	COMPANY	STOCK PRICE (P_0)	D_0	FORECAST OF FUTURE EARNINGS GROWTH	MODEL RESULT	MARKET CAP $(MILS)
121	KELLOGG	67.00	2.28	1.85%	5.4%	23,063
122	KIMBERLY-CLARK	149.88	4.28	6.51%	9.6%	52,153
123	KLA	203.01	3.60	9.29%	11.2%	32,325
124	KROGER	34.46	0.72	7.99%	10.3%	26,381
125	L3HARRIS TECHNOLOGIES	174.31	3.40	13.40%	15.6%	37,698
126	LAM RESEARCH	348.65	5.20	16.18%	17.9%	52,951
127	LAMB WESTON HOLDINGS	65.59	0.92	8.15%	9.7%	10,639
128	LEIDOS HOLDINGS	89.95	1.36	11.43%	13.1%	12,489
129	LENNAR 'A'	77.03	1.00	11.40%	12.9%	23,297
130	LINCOLN NATIONAL	35.54	1.60	18.36%	23.8%	6,528
131	LINDE	240.07	3.85	10.83%	12.6%	122,451
132	LOCKHEED MARTIN	381.98	10.40	8.97%	12.0%	108,136
133	LOWE'S COMPANIES	163.35	2.40	21.80%	23.6%	134,294
134	LUMEN TECHNOLOGIES	10.17	1.00	1.00%	11.3%	10,822
135	MARKETAXESS HOLDINGS	496.46	2.40	17.87%	18.4%	20,431
136	MARSH & MCLENNAN	113.75	1.86	4.88%	6.6%	58,220
137	MARTIN MRTA.MATS.	230.13	2.28	5.43%	6.5%	16,126
138	MASCO	56.95	0.56	14.34%	15.5%	15,036
139	MASTERCARD	332.53	1.60	11.10%	11.6%	336,867
140	MAXIM INTEGRATED PRDS.	69.20	1.92	6.02%	9.0%	19,537
141	MCCORMICK & COMPANY NV.	196.31	2.48	4.80%	6.1%	24,794
142	MCDONALDS	214.90	5.16	4.90%	7.4%	170,675
143	MCKESSON	152.12	1.68	8.07%	9.3%	25,410
144	MEDTRONIC	104.27	2.32	9.41%	11.9%	148,038
145	MERCK & COMPANY	82.18	2.44	6.63%	9.8%	201,909
146	METLIFE	38.41	1.84	3.31%	8.3%	35,653
147	MICROCHIP TECH.	106.34	1.47	7.00%	8.5%	27,974
148	MICROSOFT	214.71	2.24	14.97%	16.2%	1,661,250
149	MONDELEZ INTERNATIONAL CL.A	56.52	1.26	6.35%	8.7%	82,801
150	MOODY'S	282.54	2.24	8.62%	9.5%	54,285
151	MSCI	359.00	3.12	13.10%	14.1%	30,579
152	NASDAQ	128.93	1.96	9.29%	11.0%	21,168
153	NETAPP	44.56	1.92	3.90%	8.4%	10,468
154	NEXTERA ENERGY	71.62	1.40	8.14%	10.3%	149,636
155	NISOURCE	22.88	0.84	1.81%	5.6%	9,001
156	NORFOLK SOUTHERN	208.94	3.76	6.84%	8.8%	55,559
157	NORTHROP GRUMMAN	323.68	5.80	8.76%	10.7%	52,722
158	NORTONLIFELOCK	21.98	0.50	5.00%	7.4%	12,470
159	NVIDIA	515.80	0.64	17.44%	17.6%	340,868
160	OLD DOMINION FGT.LINES	192.60	0.60	10.86%	11.2%	23,534
161	OMNICOM GROUP	51.94	2.60	3.20%	8.5%	11,282
162	ORACLE	57.76	0.96	7.72%	9.5%	181,302
163	OTIS WORLDWIDE	62.69	0.80	4.70%	6.0%	28,171
164	PARKER-HANNIFIN	204.67	3.52	7.55%	9.4%	28,704
165	PAYCHEX	77.77	2.48	3.39%	6.7%	30,101
166	PENTAIR	46.19	0.76	3.90%	5.6%	8,301
167	PEPSICO	137.48	4.09	5.90%	9.1%	195,865
168	PERKINELMER	121.10	0.28	14.75%	15.0%	13,867
169	PFIZER	37.19	1.52	5.37%	9.7%	210,884
170	PHILIP MORRIS INTL.	77.14	4.80	5.77%	12.5%	123,446
171	PINNACLE WEST CAP.	76.92	3.13	3.38%	7.7%	9,125
172	PIONEER NTRL.RES.	94.18	2.20	11.18%	13.8%	14,828
173	PPG INDUSTRIES	122.83	2.16	5.75%	7.6%	32,398
174	PRINCIPAL FINL.GP.	42.09	2.24	6.83%	12.6%	11,310
175	PROCTER & GAMBLE	137.85	3.16	7.72%	10.2%	356,564
176	PRUDENTIAL FINL.	66.16	4.40	3.76%	10.8%	26,177
177	PUB.SER.ENTER.GP.	54.93	1.96	1.47%	5.1%	30,092
178	QUANTA SERVICES	51.91	0.20	10.03%	10.5%	8,606
179	QUEST DIAGNOSTICS	116.65	2.24	11.70%	13.9%	16,199
180	REPUBLIC SVS.'A'	91.69	1.70	7.11%	9.1%	29,801
181	RESMED	181.82	1.56	21.10%	22.1%	26,198
182	S&P GLOBAL	351.98	2.68	9.89%	10.7%	83,909

	COMPANY	STOCK PRICE (P_0)	D_0	FORECAST OF FUTURE EARNINGS GROWTH	MODEL RESULT	MARKET CAP $(MILS)
183	SEAGATE TECH.	48.04	2.60	7.85%	13.8%	13,196
184	SEALED AIR	39.56	0.64	6.45%	8.2%	6,482
185	SEMPRA EN.	124.51	4.18	6.27%	9.9%	37,057
186	SHERWIN-WILLIAMS	680.54	5.36	9.51%	10.4%	63,152
187	SKYWORKS SOLUTIONS	145.14	2.00	12.65%	14.2%	25,582
188	SNAP-ON	151.00	4.32	10.00%	13.2%	8,629
189	SOUTHERN	54.67	2.56	4.55%	9.5%	61,632
190	STANLEY BLACK & DECKER	163.15	2.80	6.83%	8.7%	28,260
191	STATE STREET	64.65	2.08	3.12%	6.5%	23,489
192	STRYKER	203.25	2.30	7.86%	9.1%	84,196
193	T ROWE PRICE GROUP	135.62	3.60	9.84%	12.8%	33,374
194	TARGET	150.52	2.72	7.51%	9.5%	82,562
195	TE CONNECTIVITY	97.52	1.92	11.00%	13.2%	35,632
196	TECHNIPFMC	7.13	0.52	1.80%	9.4%	3,092
197	TELEFLEX	362.36	1.36	13.00%	13.4%	16,996
198	TERADYNE (XSC)	85.30	0.40	16.66%	17.2%	14,377
199	TEXAS INSTRUMENTS	141.75	4.08	10.00%	13.2%	140,555
200	THERMO FISHER SCIENTIFIC	434.04	0.88	13.36%	13.6%	185,719
201	TRACTOR SUPPLY	145.79	1.60	16.65%	17.9%	17,835
202	TRAVELERS COS.	115.86	3.40	3.28%	6.3%	28,705
203	TYSON FOODS 'A'	61.37	1.68	8.83%	11.8%	17,570
204	UNION PACIFIC	190.73	3.88	6.80%	9.0%	141,411
205	UNITED PARCEL SER.'B'	160.94	4.04	7.31%	10.0%	123,343
206	UNITEDHEALTH GROUP	312.08	5.00	12.69%	14.5%	313,516
207	UNUM GROUP	18.11	1.14	5.87%	12.7%	3,796
208	US BANCORP	37.29	1.68	2.29%	7.0%	58,959
209	V F	68.90	1.92	6.32%	9.3%	29,543
210	VERISK ANALYTICS CL.A	185.92	1.08	9.83%	10.5%	31,254
211	VERIZON COMMUNICATIONS	58.84	2.51	1.64%	6.0%	240,216
212	VIACOMCBS B	28.30	0.96	2.04%	5.5%	15,752
213	VISA 'A'	200.65	1.20	8.61%	9.3%	337,640
214	VULCAN MATERIALS	132.27	1.36	9.77%	10.9%	19,393
215	W R BERKLEY	62.69	0.48	5.65%	6.5%	11,045
216	WABTEC	64.29	0.48	7.30%	8.1%	12,052
217	WALMART	139.90	2.16	6.41%	8.1%	410,072
218	WEC ENERGY GROUP	96.69	2.53	5.95%	8.7%	32,036
219	WELLS FARGO & CO	24.12	0.40	3.48%	5.2%	94,184
220	WEST PHARM.SVS.	276.20	0.64	17.40%	17.7%	21,566
221	WESTERN UNION	22.40	0.90	8.67%	13.1%	9,071
222	WILLIAMS	20.19	1.60	3.70%	12.2%	23,385
223	WILLIS TOWERS WATSON	202.81	2.72	4.85%	6.3%	27,934
224	WW GRAINGER	358.82	6.12	5.60%	7.4%	20,584
225	XCEL ENERGY	70.34	1.72	5.85%	8.5%	38,418
226	XILINX	108.00	1.52	7.47%	9.0%	28,922
227	YUM! BRANDS	94.37	1.88	6.63%	8.8%	29,697
228	ZOETIS A	160.04	0.80	9.27%	9.8%	77,710
229	Market-weighted Average				11.6%	

Notes: In applying the DCF model to the S&P 500, I include in the DCF analysis only those companies in the S&P 500 group which pay a dividend and have an available positive long-term earnings growth estimate.

D_0 = Current dividend per Refinitiv.
P_0 = Average of the monthly high and low stock prices during the three months ending October 2020 per Refinitiv.
g = I/B/E/S forecast of future earnings growth October 2020 per Refinitiv.
k = Cost of equity using the quarterly version of the DCF model shown below:

$$k = \left[\frac{d_0(1+g)^{\frac{1}{4}}}{P_0} + (1+g)^{\frac{1}{4}} \right]^4 - 1$$

COMPARABLE EARNINGS VALUE LINE ELECTRIC UTILITIES

	COMPANY	AVERAGE FORECAST ROE 2020 TO 2023-2025	ADJUSTMENT FACTOR	FORECASTED RETURN ON AVERAGE EQUITY
1	ALLETE	7.3%	1.0233	7.5%
2	Alliant Energy	10.3%	1.0150	10.5%
3	Amer. Elec. Power	10.3%	1.0402	10.7%
4	Ameren Corp.	9.8%	1.0398	10.2%
5	AVANGRID Inc.	4.5%	1.0044	4.5%
6	Avista Corp.	7.0%	1.0192	7.1%
7	Black Hills	8.8%	1.0268	9.1%
8	CenterPoint Energy	11.3%	1.0384	11.8%
9	CMS Energy Corp.	13.5%	1.0402	14.0%
10	Consol. Edison	7.7%	1.0233	7.8%
11	Dominion Energy	10.5%	1.0158	10.7%
12	DTE Energy	10.7%	1.0030	10.7%
13	Duke Energy	8.0%	1.0214	8.2%
14	Edison Int'l	9.0%	1.0226	9.2%
15	Entergy Corp.	10.3%	1.0267	10.6%
16	Evergy	7.8%	1.0107	7.9%
17	Eversource Energy	8.7%	1.0341	9.0%
18	Exelon Corp.	8.5%	1.0220	8.7%
19	FirstEnergy Corp.	16.3%	1.0535	17.2%
20	Fortis Inc.	6.7%	1.0213	6.8%
21	Hawaiian Elec.	8.2%	1.0208	8.3%
22	IDACORP Inc.	9.2%	1.0177	9.3%
23	MGE Energy	9.5%	1.0304	9.8%
24	NextEra Energy	11.5%	1.0295	11.8%
25	NorthWestern Corp.	8.2%	1.0184	8.3%
26	OGE Energy	11.8%	0.9992	11.8%
27	Otter Tail Corp.	10.8%	1.0227	11.1%
28	Pinnacle West Capital	10.2%	1.0239	10.4%
29	Portland General	7.5%	1.0112	7.6%
30	PPL Corp.	13.0%	1.0247	13.3%
31	Public Serv. Enterprise	11.0%	1.0249	11.3%
32	Sempra Energy	10.3%	1.0520	10.9%
33	Southern Co.	12.2%	1.0188	12.4%
34	WEC Energy Group	11.8%	1.0170	12.0%
35	Xcel Energy Inc.	10.2%	1.0291	10.5%
36	Average			10.0%

Data from Value Line reports	
West Value Line	23-Oct-20
East Value Line	14-Aug-20
Central Value Line	11-Sep-20

Note: The adjustment factor is computed using the formula: 2 x (1 + 5-year change in equity) ÷ (2 + 5-year change in equity). The adjustment factor is required to convert the Value Line ROE data, which are based on year-end equity, to a rate of return on equity based on average equity for the year.

RESEARCH LITERATURE THAT STUDIES THE EFFICACY OF ANALYSTS' EARNINGS FORECASTS

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